

# BURR PICKING

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## INTRODUCTION

**1. Objects.**—**Burr picking**, or **burring**, is the first operation through which the wool passes after it has been scoured and dried, except in some cases where it is run through a duster immediately after the drying. When this is done, it is more for the purpose of making the stock open and lofty, so as to facilitate the work of the burr picker, than for the sake of the small amount of dust that is removed. The primary object of burr picking is to remove all the burrs and vegetable matter possible before the stock is passed to the carding machines. Under the head of burrs, various particles of vegetable matter that become attached to the fleece during the life of the sheep are included, although a burr is really a vegetable seed or husk covered with sharp spines, or prickles. Besides actual burrs, the wool often contains twigs, straws, chaff, etc., which, together with finely divided vegetable matter, as crumbled leaves and organic dust, is commonly known as **shives**.

The nature of the burrs found in wool varies greatly with the locality in which the wool is grown. Probably the worst wools in this respect are those coming from South America, notably from Buenos Ayres and grown in the valley of the Rio de la Plata. These wools are infested with a spiral-shaped burr from  $\frac{1}{2}$  inch to 2 inches in length, and curled up somewhat like a snail's shell. They are extremely difficult to remove, since they cling with great tenacity to the wool and often are broken into small pieces before losing their hold on the fibers. These are the worst burrs known;

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other wools contain in comparison but few burrs and those generally of a kind much more easily removed. The burrs in this class of wool are often called **mestizo burrs**, this name being given on account of the mixed blood of the sheep of that locality.

**2.** If the burrs are not removed from the wool they are broken into innumerable small particles during the operation of carding, which, remaining in the roving, make hard bunches that cause the yarn to spin unevenly and to have an irregular, rough appearance, which is characterized as **twitty**. Small particles of vegetable matter thus passing through all of the manufacturing processes and occurring in the cloth are known under various terms; as, **specks, notes, burrs**, etc. These must be picked out by hand; and in some cases this causes bad holes to be made in the cloth, which must be mended. Vegetable matter will not absorb dye stuffs in the same proportion as wool fibers; consequently, it is seen on the surface of piece-dyed cloths as specks of a lighter color. Burrs in the wool are also a great detriment to the cards, as they tend to dull, bend, and otherwise injure the card clothing and also choke up the card so that stripping, or cleaning, is necessitated much oftener than would otherwise be required.

From what has been said, it will be seen that burrs are matted with the fibers and must be torn from them with considerable force, thus necessitating the employment of a burr picker; in fact, they sometimes cling so tenaciously that the burr picker removes a considerable amount of wool with the burrs. Another object of the burr picker, although of a secondary nature, is to open the wool and leave it in a more lofty condition for the carding machines. This saves a great deal of unnecessary wear and tear on the cards, which would otherwise be strained in opening out bunches of wool that were matted.

## TYPES OF BURR PICKERS

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### PARKHURST BURR PICKER

**3.** A very effective machine for removing the burrs from wool, known as the improved **Parkhurst burr picker**, is shown in Figs. 1 and 2; Fig. 3 illustrates the working parts. The construction and operation of this machine are such as to have the greatest cleaning effect on the wool with the least possible damage to the fiber. The machine is of solid construction, the framework being made of iron, with the exception of a few minor parts, which, as shown in Fig. 3, are constructed of wood. The greatest care is taken to have all working parts firmly adjusted and free running, since the high speed necessary in a burr picker, together with the large number of parts in motion, render it a machine requiring a considerable amount of power for driving purposes.

**4. Construction.**—The stock is fed to the machine on an ordinary form of slatted feed-apron *a* that runs on hardwood rolls, the first roll being provided with a screw adjustment by means of which it can be drawn back and the apron tightened, should it become slack through stretching or wear. The feed-rolls *b* are fitted with steel cockspur teeth, so that large burrs are not broken into minute particles, but the stock is held loosely and is not injured while the picker cylinder opens it out. The cockspur teeth are made separately and are securely fastened in grooves cut around the feed-rolls. The rows of teeth are about 1 inch apart and the teeth of the upper roll pass between those of the lower roll. The teeth of each roll being curved back from the direction in which the roll rotates, the stock is held firmly while at the same time the feed-rolls do not become wound and choked with stock, as is liable to occur with rolls covered with

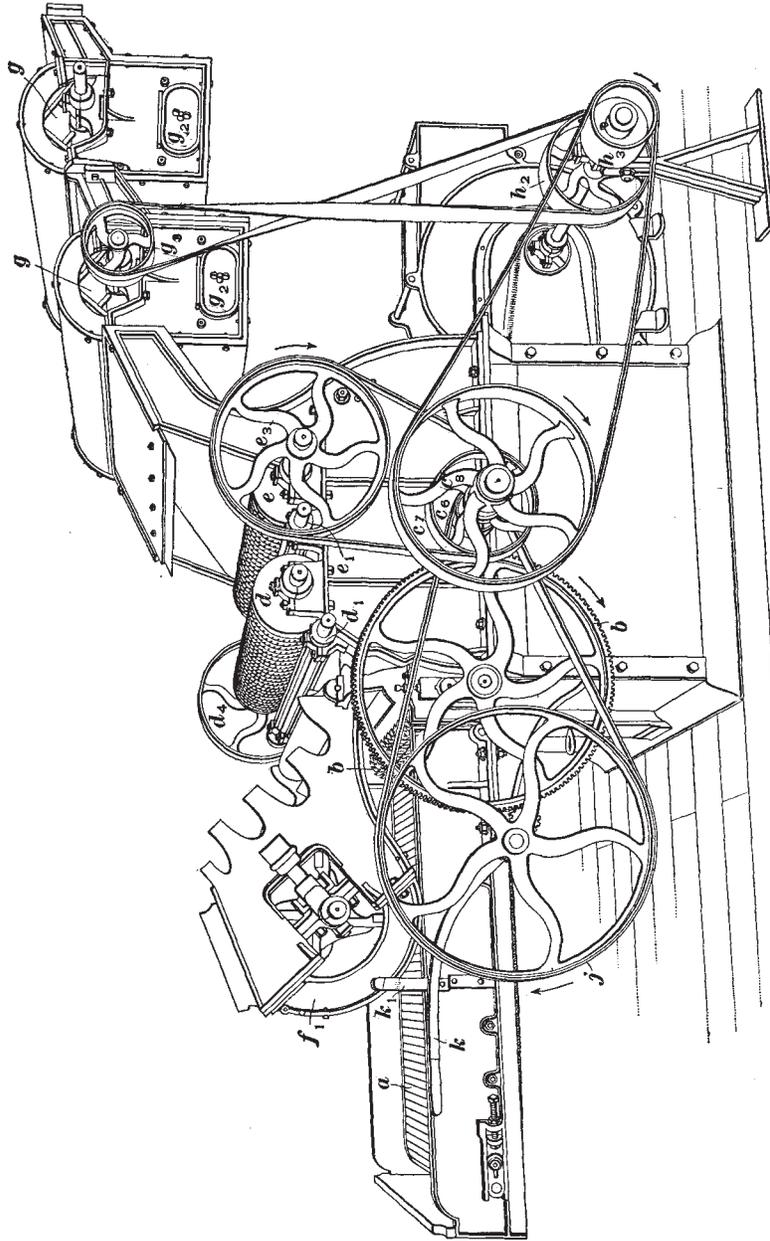


FIG. 1

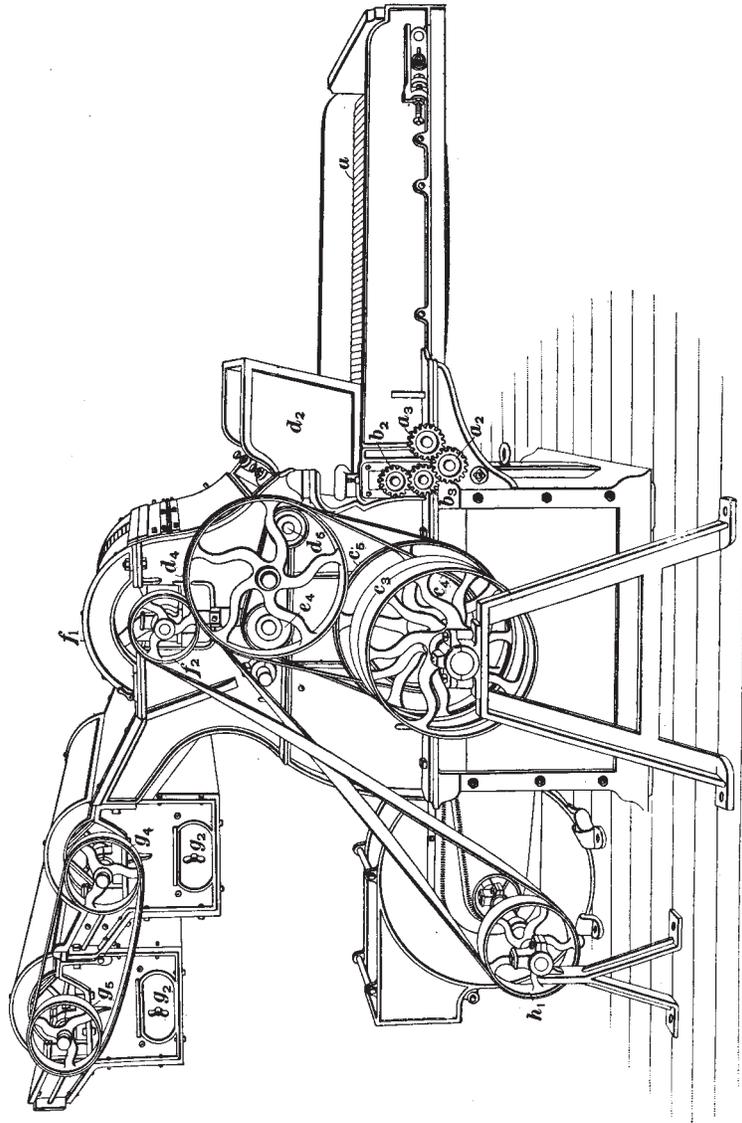


FIG. 2

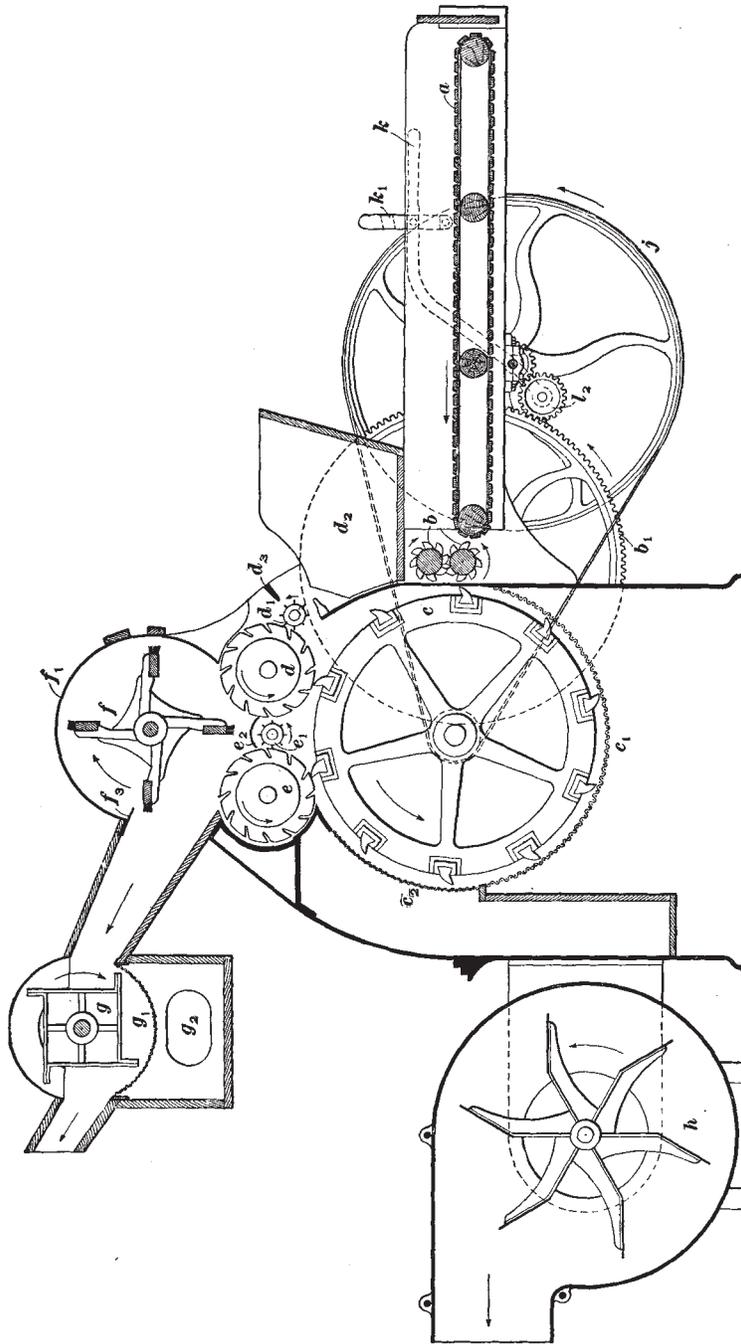


FIG. 3

straight, or pin, teeth. In some machines the top feed-roll is driven slightly faster than the bottom roll, so that the latter will keep the top feed-roll clear of wool and prevent its winding. The picking cylinder *c* running upwards will, in this case, keep the bottom roll clean, but, should the picking cylinder run downwards, the bottom feed-roll should run faster than the top one.

5. The picking cylinder *c* is for the purpose of opening the wool as it is held by the feed-rolls and for conveying it from them to the burr cylinders. It is constructed, in this picker, with ten cross-bars securely fastened to spiders attached to the picking cylinder shaft, which may be considered as the main shaft of the machine. The cross-bars are set with steel teeth, which are dovetailed into them in such a manner as to be securely fastened. As indicated by the arrow, the picking cylinder of this machine runs upwards past the feed-rolls and combs out the wool, making it ready for the burr cylinders.

The two burr cylinders *d, e* in this machine are located over the picking cylinder and are of the steel-ring variety. Some burr pickers have only one burr cylinder. Most burr rolls are made by winding Garnett wire in a spiral groove cut around the roll. The steel-ring burr cylinders, which are somewhat better than the wire-wound rolls, are made of steel rings with the teeth cut on them. These rings are slipped on a smooth cylinder, or roll, packing rings being inserted between the rings to keep them an even distance apart. A varying number of rings per inch may be used, depending on the fineness of the stock that is being burr-picked. The whole is fastened securely and makes the best kind of a burr roll, as it is not liable to injury and, if damaged, can be readily repaired. The construction of burr rolls and burr wire will be explained later.

In connection with the burr cylinders there are two burr guards *d, e*. These are small rolls in which eight steel blades are placed in slots cut lengthwise of the roll. In operation, the wool sinks into the crevices, or spaces, between

the teeth in the burr cylinders and is thus securely held, while the burrs remaining more or less on the surface are knocked out by the blades of the burr guards, which are set close to the surfaces of the burr cylinders. Care should be taken, however, that there is no contact between the burr guards and cylinders, as the latter would be ruined. The wool is removed from the burr cylinders by the brush *f*, which consists of four wooden cross-bars set with stiff bristles from 1¼ to 2 inches in length, and supported by spiders fastened to a central shaft. The brush delivers the wool to the beater *g* by means of the current of air that it produces.

**6.** The beater is a square, box-like drum built up from a central shaft and having four blades attached; its object is to beat out such loose material as dust, shives, etc., which will then fall through the screen *g*, placed under the beater. Some machines have two beaters, as shown in Figs. 1 and 2; others only one, as shown at *g*, Fig. 3; while sometimes they are entirely dispensed with. The beaters are placed at the spout, where the wool leaves the machine, and, as the stock at this point is opened out nicely, they easily remove a large amount of finely divided dirt that has escaped the previous operations and that would otherwise pass through the machine with the wool.

A large blower, or fan, *h* is placed on the floor at the rear of the machine and creates a draft through the screen *c*, which is placed opposite the feed-rolls, the object being to remove light dirt and dust from the wool and discharge it outside of the mill through suitable pipes. The blower consists of a cylindrical iron box in which a six-bladed fan is mounted on suitable bearings. One important advantage of locating the blower for a burr picker on the floor and at the rear of the machine, is that an under draft is secured, which is an important factor in cleaning stock. The current of air in this case does not hinder the fall of the heavy particles of dirt shaken from the stock by the picker cylinder but rather assists it, and such dirt is therefore readily deposited beneath the screen, or grate, *c*, which is placed under the



picking cylinder, while the lighter dust is drawn away through the screen  $c_2$  by the blower.

7. The top of this machine is so arranged that it swings back, carrying the brush with it. This is a great advantage in cleaning the machine, as it exposes the burr cylinders and guards so that they may be easily cleaned and made ready for the next lot of wool. Fig. 1 shows the bonnet  $f_1$  laid back on the feed-apron and the burr cylinders exposed. The machine is provided with hinged doors, located under the feed-apron, for cleaning the space under the picking cylinder, which can be quickly cleaned between lots, as the doors can be opened without removing screws or bolts. Sliding brushes are placed under the screens beneath the beaters for the purpose of cleaning them. There is also a brush for cleaning the screen at the rear of the picker cylinder, which if clogged hinders the draft of the blower. This screen sometimes becomes coated with a gummy substance; if greasy wool is used it must then be taken out and washed with soda, potash, or any compound that will cut the grease. There are also small handholes  $g_2$  for cleaning the spaces under the beater screens and for removing the fine dirt and shives that fall through them.

8. **Driving.**—The driving of the various parts of the burr picker will be readily understood by the following description in connection with Figs. 1 and 2: The main shaft of the machine is fitted with tight and loose driving pulleys  $c_3$  and all working parts are belted from the main shaft. Only one belt is required to drive the machine, except on the large size (48-inch width) where a double drive is used, that is, a tight pulley on each side of the machine driven from a countershaft on which tight and loose pulleys are arranged. The front burr cylinder is driven by a 12-inch pulley  $c_4$  on the picker shaft, which drives a 16-inch pulley  $d_4$  on the front burr-cylinder shaft. This drive is shown in Fig. 2. The rear burr cylinder is driven on the other side of the machine, as shown in Fig. 1, by a  $9\frac{1}{2}$ -inch pulley  $c_5$  on the main shaft, which drives a 16-inch pulley  $e_5$ .

on the shaft of the rear burr cylinder. The blower is driven by a 17-inch pulley  $c_8$  on the main shaft, which drives a 6-inch pulley  $h_8$  on the blower shaft, also shown in Fig. 1.

The two burr guards are driven by a 17-inch pulley  $c_6$  on the main shaft, which drives two pulleys  $e_4, d_6$  on the burr-guard shafts, the pulley on the front burr-guard shaft being 4 inches in diameter and the pulley on the rear burr-guard shaft being 5 inches in diameter; these pulleys are shown in Fig. 2. A driving pulley  $h_2$ , 10 inches in diameter, on the blower shaft drives an 8-inch pulley  $g_3$  on the first beater shaft with a crossed belt, as shown in Fig. 1, and on the opposite side of the machine the two beaters are connected by a belt and 8-inch pulleys  $g_4, g_5$ , as shown in Fig. 2. A 10-inch

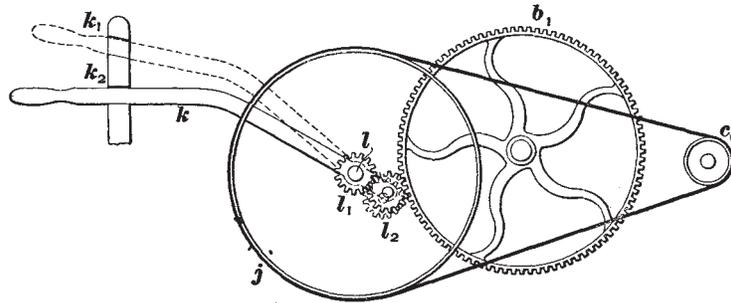


FIG. 4

pulley  $h_1$  on the blower shaft drives a 7-inch pulley  $f_2$  on the shaft of the brush with a crossed belt. The driving of the feed-rolls is shown in Fig. 1, and is as follows: A  $4\frac{1}{2}$ -inch pulley  $c_6$  on the picker-cylinder shaft drives a pulley  $j$ , 24 inches in diameter, on a stud  $l$ , see Fig. 4. A pinion gear  $l_1$  with 15 teeth, fastened to the pulley  $j$ , drives an intermediate gear  $l_2$ , which in turn meshes with a 150-tooth gear  $b_1$ , fastened to the bottom feed-roll shaft. The top and bottom feed-rolls are coupled together with 15-tooth gears  $b_2$  and  $b_3$  on the opposite side of the machine, as shown in Fig. 2, the gear on the bottom feed-roll shaft also driving a 17-tooth intermediate  $a_2$  which drives a 17-tooth gear  $a_3$  on the front apron-roll shaft, thus driving the feed-apron.

**9. Device for Stopping Feed.**—There is a device on this machine for stopping the feed-rolls and apron without stopping the whole machine; this allows the operator to stop the delivery of wool to the picking cylinder immediately when anything wrong is seen with the working of the machine. The mechanism is simple and effective. A lever marked  $k$ , Fig. 4, is pivoted on the stud  $l$ . The pinion gear  $l_1$  is loose on this stud, as is also the pulley  $j$ . The gear  $l_2$  is loose on a stud fixed at the extremity of the lever  $k$ . Thus, when the lever is raised, as shown by the dotted lines, and held in that position by the slot at  $k_1$ , the gear  $l_2$  will be withdrawn from contact with the gear  $b_1$ ; this stops all motion of the feed-rolls and apron. The slots  $k_2$ ,  $k_1$  are cut in a piece of steel bolted to the side of the feed-trough and hold the lever firm when the pinion is in or out of contact with the gear  $b_1$ .

**10. Operation.**—In operation, the stock is spread evenly on the feed-apron  $a$ , Fig. 3, either by hand or by an automatic or self-feed, and is carried forwards to the pair of cockspur feed-rolls  $b$ . The wool is held by the feed-rolls and is combed and opened out by the rotating picking cylinder  $c$ , which revolves upwards past the feed-rolls. The picking cylinder carries the wool to the burr cylinders  $d$ ,  $e$ , and the stock is deposited in the spaces between the rows of teeth on the burr cylinders, while the burrs lie on the surface and are knocked off into the burr box  $d_2$  by the burr guards. The passage of the material from the feed-rolls to the picking cylinder and from the picking cylinder to the burr cylinders, the cylinders being in rapid rotation, results in the wool being beaten, drawn, and opened, the burrs gradually being thrown to the outside and ultimately hanging loosely from the burr cylinders from which they are easily knocked by the burr guards.

**11.** It may be said with regard to this machine that the burr guard  $e_1$  does not throw the burrs clear of the machine, as does the guard  $d_1$ , but instead throws them either on to the first burr cylinder, where they then come under the action of  $d_1$ , or else into the picking cylinder, where, unless they fall

through the grate, they are carried around until again brought under the action of the burr cylinders.

**12.** All dirt that is knocked from the wool by the picking cylinder  $c$ , if heavy, falls through the grate, or screen,  $c_1$  into the space underneath, whence it can be removed periodically by opening a hinged door underneath the feed-apron of the machine. If the dirt is light, as dust and shives always are, it is removed by the blower  $h$  through the screen  $c_2$  and blown outside of the mill through a suitable pipe. The wool fiber is removed from the burr cylinders  $d, e$  by the rotating brush  $f$  and passed along by the current of air generated by the brush to the beater  $g$ , which revolves at a rapid rate and beats much loose matter that has escaped the previous operations through the screen  $g_1$  into the space underneath, whence it may be removed through the handhole  $g_2$ .

Two beaters are of great value for fine stock and also for knitting stock, but for ordinary wool one of them is sometimes removed. Frequently when long-stapled stock, such as carpet and other coarse wool, is being run through the burr picker, both beaters are removed. After passing through the beaters, the stock is conveyed by a suitable pipe to the gauze room, where it is ready for the next process.

**13.** In Fig. 3, a steel straightedge, or knife, is placed at  $f_3$  to prevent the stock from winding around the brush and also to keep the bristles of the brush clean. At  $d_3$  a similar knife is placed to prevent the burrs that are knocked out by the burr guard  $d_1$  from flying back into the burr cylinder  $d$ . A guard  $e_2$  is placed over the burr guard  $e_1$  in order to prevent the wool removed from the burr cylinder  $d$  by the rotating brush from falling on the burr guard  $e_1$  and being thrown on the picking cylinder  $c$ .

**14. Burr Cylinders.**—Most mills are equipped with two sets of burr cylinders—a coarse set for coarse stock, and a fine set for finer stock. The necessity for this is that if a cylinder with coarse teeth on it is used for fine stock, much of the wool will be pulled from it and cast out. Good burr picking removes the burrs and as little of the stock with

it as possible. On the other hand, if cylinders covered with fine set teeth are used for coarse stock, the wool will not penetrate into the spaces between the steel rings of teeth, and there is danger of the fiber being broken and of a good deal of wool being knocked into the burr box by the guards.

The ordinary type of burr cylinder is made of iron, and after being trued has a continuous spiral, or helical, groove cut around it. A specially prepared toothed wire is wound around the cylinder in the groove cut on it and the spaces between the rows of wire carefully staked in order to hold the wire firm. The roll is then ground to a true surface. The burr wire used for the burr rolls of pickers has a flat top; in Fig. 5 two kinds are shown, one with a long and one with a short top. The short-top wire is suitable for fine, short wool, while the long-top wire is especially adapted for

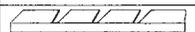
WIRE	SIZE	STYLE	TH'S PER I"
	2	Long Top	5 - 8
	3	" "	8 - 12
	2	Short "	5 - 8
	3	" "	8 - 12

FIG. 5

longer and coarser wool. This wire is drawn from fine steel and is made with a rib, or flange, at the base, so that when staked into the cylinder the metal will crowd, or overlap, the base of the wire, thus holding it firm. The teeth are all cut in the wire before it is wound on the cylinder. Garnett wire, as this wire is commonly called, takes its name from that of the inventor, who first used it on machines for tearing up rags in the preparation of shoddy and mungo. Old burr rolls, and other cylinders that are covered with burr, or similar, wire may be recovered when damaged or worn out.

This type is known as the wire-wound roll, but in the Parkhurst picker a special type known as the steel-ring burr cylinder is used. The teeth for this roll are cut on a solid steel ring with a hole of the exact diameter to be slipped on a smooth iron roll. The rings of teeth are kept apart by

being alternated with packing rings of the proper thickness that have no teeth, the whole being firmly secured. The advantage of this roll is that it can be repaired without rewinding, as is necessary with the wire-wound rolls.

**15. Speeds.**—With regard to the speeds of the various working parts of the burr picker, it may be said that high speeds are very necessary in order to accomplish the complete removal of the burrs. The following list gives the speeds of the various parts of the Parkhurst picker, and may be figured by the student with the data previously given in regard to the driving of the parts:

Picking cylinder . . .	450	revolutions per minute
Front burr cylinder . .	337	revolutions per minute
Rear burr cylinder . .	267	revolutions per minute
Blower . . . . .	1,275	revolutions per minute
Beaters . . . . .	1,593	revolutions per minute
Front burr guard . . .	1,912	revolutions per minute
Rear burr guard . . .	1,530	revolutions per minute
Brush . . . . .	1,821	revolutions per minute
Feed-rolls . . . . .	8½	revolutions per minute

**16.** This picker is built in four widths; viz., 24-inch, 30-inch, 40-inch, and 48-inch. The production of the 48-inch machine is from 4,000 to 6,000 pounds per day according to the amount of stock placed on the feed-apron, and also to the number of times the stock is run through the machine, which depends on the amount of burrs in the stock, once being usually sufficient. This burr picker requires from 3 to 10 horsepower, depending on the width of the machine, and should be driven with at least a 5-inch belt.

#### SARGENT BURR PICKER

**17.** In Fig. 6, a burr picker known as the **Sargent multiplex burr picker** is shown with a self-feed attached. This machine works on practically the same principle as the Parkhurst picker. The wool is opened by a picking cylinder and is deposited on a pair of burr cylinders covered with

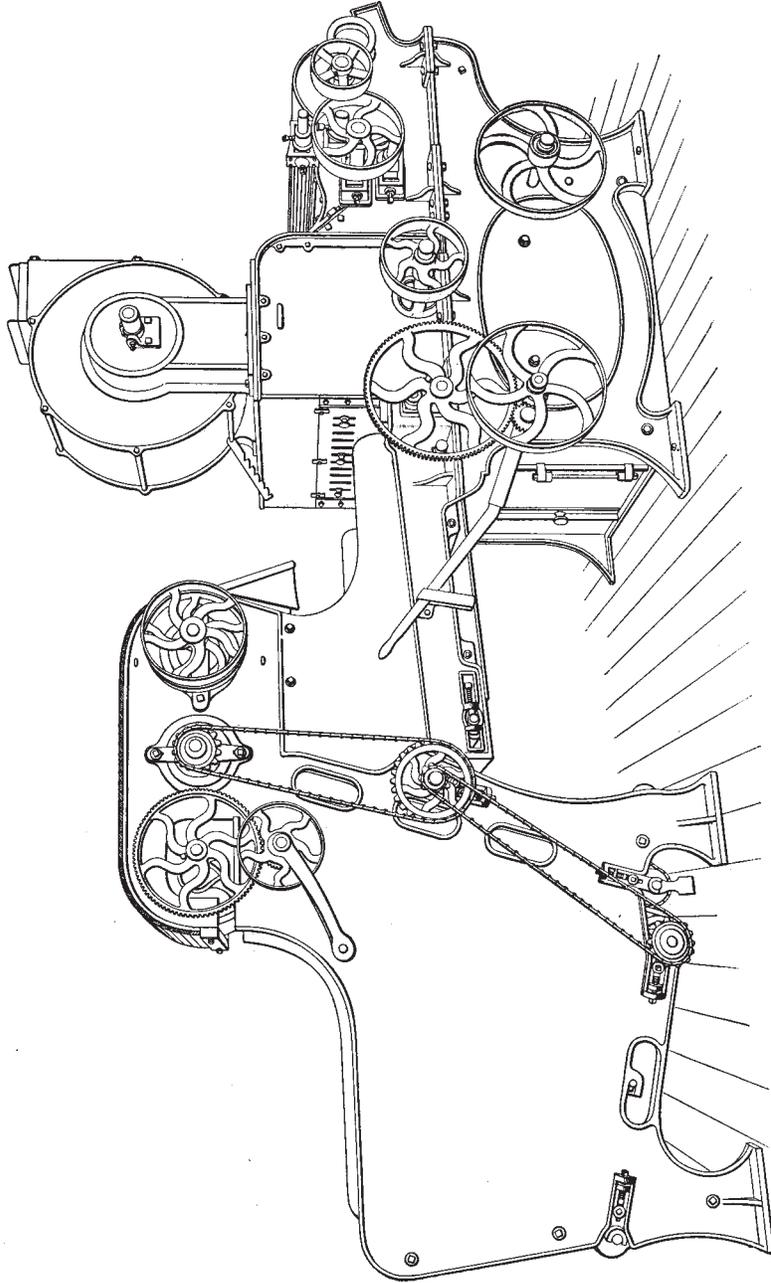


FIG. 6

burr wire, where the burrs are removed by means of burr guards in the usual manner. The machine is constructed, however, somewhat differently from the Parkhurst picker. The burr cylinders and guards are placed opposite the feed-rolls instead of over the picking cylinder. The fan, or blower, is placed on the top of the machine instead of on the floor behind the machine. It removes light dirt and dust from the stock and discharges it outside of the mill by means of a suitable pipe in the usual manner, but as the fan is on the top of the machine, it creates an over draft instead of an under draft through the machine.

The stock is fed on a slatted feed-apron either by hand or by a self-feed. The wool is taken by the feed-rolls and delivered to a picking cylinder similar in construction to that of the Parkhurst picking cylinder, but which runs past the feed-rolls downwards instead of upwards. The stock is subjected to the action of the picking cylinder and the grid, or rack, underneath it, through which drops a large amount of dirt that can be subsequently removed. The wool is then taken by the burr cylinders and sinks into the spaces between the rows of teeth, while the burrs lie on the surfaces of the cylinder and are knocked off by the burr guards. The lower burr guard running in connection with the first burr cylinder throws the burrs on the floor behind the machine, while the upper guard throws the burrs from the upper burr cylinder into a receptacle on the top of the machine. The burr cylinders are stripped by a brush similar to that of the Parkhurst burr picker, and the stock blown to the gauze room by the current of air generated by the rotating brush. The speeds of the different parts of this machine should be about the same as those of corresponding parts of the Parkhurst picker.

The self-feed shown attached to the burr picker illustrated in Fig. 6 is known as the **Sargent low feed**. This self-feed is adapted for burr pickers, cone and carbonizing dusters, mixing pickers, or any similar machine.



## SINGLE BURR-CYLINDER PICKER

18. A burr picker with but one burr cylinder instead of two is very popular with mills using wools with few burrs, but in case of very burry stock it is customary to run it through a single burr-cylinder machine several times, so as to be sure that the burrs are all removed, since this machine is not nearly so effective as the double burr-cylinder machines previously described.

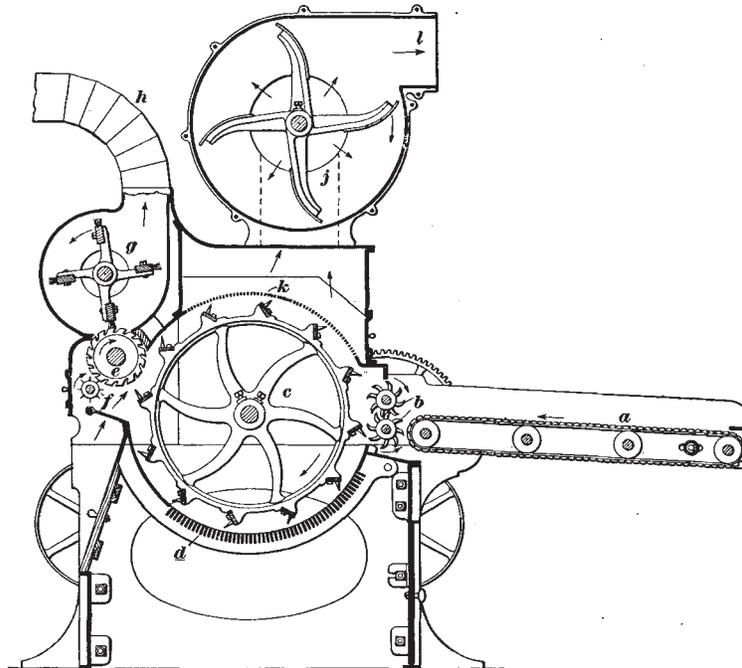


FIG. 7

A section of a single burr-cylinder machine is shown in Fig. 7; its operation is as follows: The stock is fed in the usual manner on a slatted feed-apron *a*, from which it is taken and fed to the machine by the cockspur feed-rolls *b*. The picking cylinder *c* then takes the stock and carries it over the rack *d*, thus shaking out the loose dirt, which drops

through into the lower part of the machine, from which it may be removed. The wool is then deposited on the burr cylinder *e*, where the burrs are removed and cast on to the floor at the rear of the machine by the burr guard *f*. The wool is removed from the burr cylinder by means of a rotating brush *g*, which also generates a current of air for delivering the stock through the pipe *h* to the gauze room. A constant current of air is maintained in the machine by the blower *j*, which draws the dust through the screen *k* (which retains the wool) and conveys it to the outside of the mill through the pipe *l*. The inlets for the air are under the feed-rolls and at the back of the machine under the burr guard.

#### GODDARD BURR PICKER

**19.** The **Goddard, or Curtis and Marble, burr picker** is favorably known to the trade and is found in some of the best mills. It is shown in Fig. 8 and in section in Fig. 9. The machine is constructed with the same objects in view as those previously described; namely, to remove burrs, shives, dust, and other foreign matter from the wool, and also to open the stock and make it lofty for the cards without breaking or injuring the fiber.

The principle of this machine is somewhat different from the burr pickers previously described, but still the same general features are present; i. e., opening the wool with a picking cylinder and delivering it to burr cylinders, from which it is stripped by a rotating brush, the burrs being removed by burr guards.

**20. Construction.**—The feed-rolls are set with cockspur teeth, which hold the wool securely while the teeth of the picking cylinder thoroughly open it. The bottom feed-roll is stripped by the picking cylinder, and in order to prevent all chance of the stock winding around the top feed-roll, this roll is driven faster than the bottom roll; thus, the wool is cleaned from the back of the cockspur teeth on the top feed-roll by the points of the teeth on the bottom roll.

The feed-apron and feed-rolls in this machine may be stopped by means of a lever without stopping the rest of the machine, as described in the case of the other burr pickers.

**21.** The picking cylinder is composed of sixteen cross-bars, which are attached to spiders fastened to the main shaft of the machine. The cross-bars are filled with round-pointed teeth of steel, which are placed staggered, so that at each revolution of the cylinder the teeth cover every sixteenth inch of the width of the machine. Above the picker cylinder is a perforated brass screen fastened to an iron frame and held in place by buttons, so that it can be readily removed for cleaning. This screen has perforations of sufficient size to allow fine dust and dirt to be removed from the wool through it. The screen is removable to give access to the picker cylinder for cleaning or other purposes.

Beneath the picker cylinder is a grate, or grid, made of angular iron bars. This grate is made especially firm and will not bend out of shape; thus, the spaces between the bars of the grate are always the same. The grate is made fine enough so that loss of wool is avoided, but the heavy dirt, shives, etc., are allowed to drop through it. The grate is hinged at the rear and may be lowered in order to clean it and the picking cylinder between different lots of wool.

At the rear of the picking cylinder, two burr cylinders are built up on central shafts with alternate steel-toothed rings and solid packing rings. These burr rolls should be made of the right-sized toothed rings, or burr wire, to suit the class of wool that is being operated on, and should be spaced fine or coarse to suit the same. The burr cylinders in the Curtis and Marble pickers are not of the same size, as they are in the machines previously described, but one is smaller and works over the larger one—running in the opposite direction. The larger burr cylinder is provided with a burr guard that knocks the burrs from the surface of the cylinder. Working in conjunction with this burr guard is a smaller one, which prevents the burrs and other refuse from being carried over on to the brush cover. On this

machine a rotating brush, with six cross-bars filled with bristles, strips the stock from the burr cylinders and delivers it to the gauze room through a suitable spout or pipe.

**22. Oilers.**—In Fig. 8, a square tank will be seen placed over the spout where the wool leaves the machine. This is a device for oiling the wool as it leaves the picker so that it

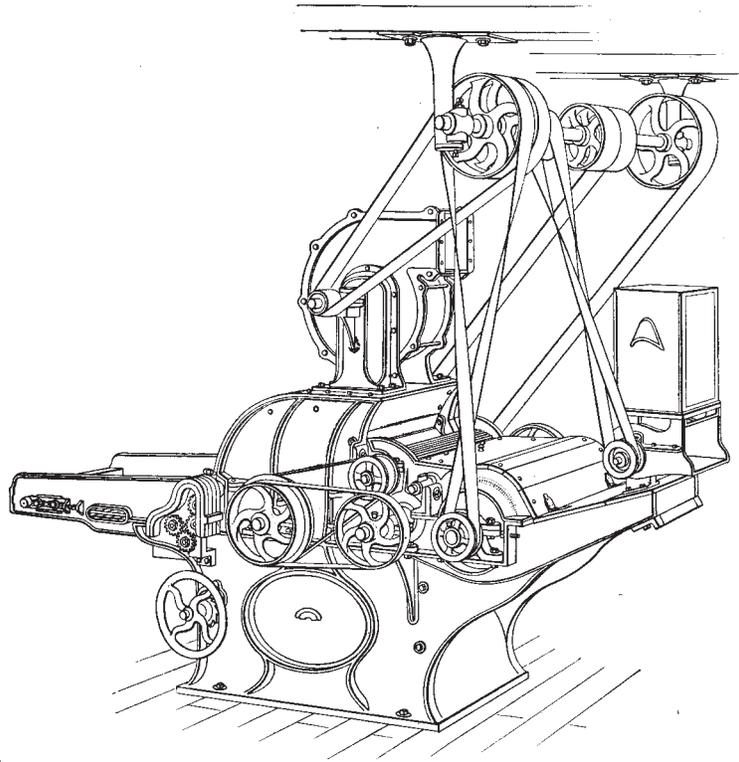


FIG. 8

will be ready for carding. This may be attached to the picker when desired. The **oiler** consists of a revolving brush that throws the oil supplied by a tank over the wool as it passes from the picker. Oiling wool by mechanical devices, either at the picker spout or elsewhere, is not generally approved by the trade. Oilers afford an easy means of lubricating

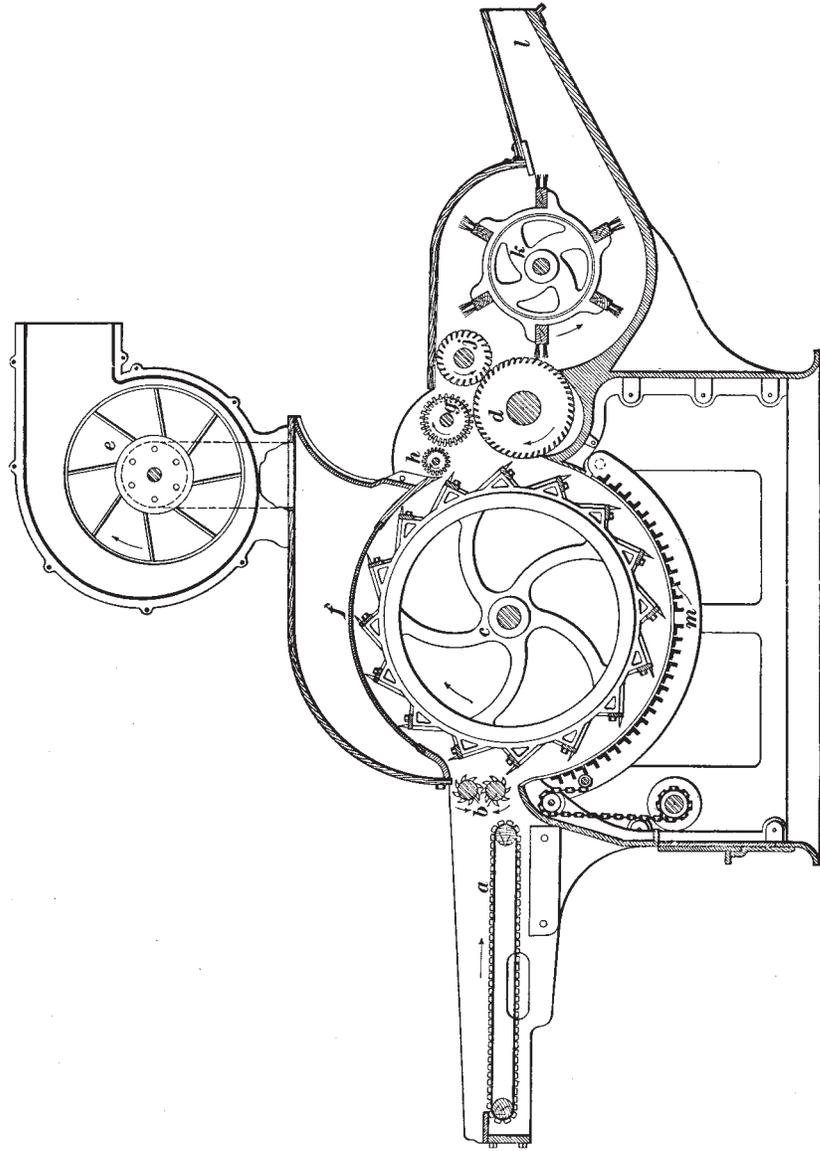


FIG. 9

cheap stock, but are seldom used on fine stock, as will be explained in another Section.

**23. Operation.**—In operation, the stock is fed to the traveling apron either by hand or by a self-feed. The apron *a*, Fig. 9, carries the wool to the cockspur feed-rolls *b* of the machine, where it is loosely held while being combed and opened out by the picker cylinder *c*. The wool is thus opened out at the start and the burrs and dirt loosened. The picker cylinder revolves upwards past the feed-rolls and carries the wool to the large burr cylinder *d*. The exhaust fan, or blower, *e* on the top of the machine creates a strong draft of air, which removes loose and small particles of dirt through the perforated brass screen *f*, and also lifts the fibers of wool from the picker cylinder, so that they are more readily caught by the teeth of the burr cylinder *d*. This cylinder takes the stock from the picker cylinder, receiving the fibers in the spaces between its toothed rings, while the burrs and other matter being larger than the fibers of wool remain on the surface of the cylinder and are removed by the rapidly revolving burr guard *g*. Working in connection with this burr guard is a smaller roll *h*, which prevents the burrs and refuse from being thrown on to the brush cover. The burrs thrown out by the burr guards are carried downwards by the picker cylinder, and such as do not drop through the grate *m* under the cylinder are carried forwards and thrown into a burr box through an opening beneath the feed-rolls of the machine. A small burr, or cotter, cylinder *j* operates in conjunction with the large burr cylinder, revolving slowly in the opposite direction and opening out cotted lumps of wool. The revolving brush *k* cleans the wool from both burr cylinders and delivers it through the spout *l* to the gauze room.

**24.** The Goddard picker, as shown in Fig. 8, requires a countershaft. The picking cylinder, fan, and revolving brush are driven direct from the countershaft, as is also the oiler, if used. The other parts of the machine are driven from the

main picker shaft. The following table shows the capacity of the different widths of these machines, the amount of work turned off varying, of course, under different conditions.

Size of Picker Inches	Diameter of Picking Cylinder Inches	Capacity per Day Pounds
24	24	600 to 1,200
30	30	1,200 to 2,400
40	30	1,600 to 3,200
46	36	2,200 to 5,000
48	36	3,000 to 7,000

### MANAGEMENT OF BURR PICKERS

**25.** In regard to the management and proper care of burr pickers, it may be said that one of the most important points is to clean periodically the various parts of the machine. All perforated, or wire, screens, grates, conducting pipes, etc. should be kept clean and clear of dirt and grease. If they are clogged up, they hinder the removal of the dirt from the wool and also reduce the efficiency of the fan, thus weakening the strength of the air-currents through the machine. Screens with small perforations will become completely coated with grease and gummy dirt, and when found in such condition should be immediately taken from the machine and washed with a strong solution of soda. When the gum is thick, a good deal of it can be scraped off before the screen is washed. The spaces under the picking cylinder and under the beaters of a Parkhurst picker should be frequently and regularly cleaned out. On the Parkhurst machine the swing-back bonnet is so arranged that it can be lifted back after the belt has been thrown off from the brush, thus allowing the burr cylinder and interior of the machine to be cleaned.

After a batch of wool has been run through the machine, if much fiber is clinging to the burrs that have been cast out,

the burrs are sometimes run through the machine again in order to obtain all the fiber possible. As a rule, however, this does not pay, not only because of the time required, but also because of the danger, where there are so many burrs, of some of them passing forwards with the wool instead of being thrown out of the machine the second time. As burr pickers run at a high speed, it is essential that all bearings of rapidly rotating parts be oiled at least twice a day; otherwise, there is danger of the journals heating and becoming fast in the bearings. All belts used in connection with a burr picker should be laced, as there is danger of accidents if belt hooks are used, since the belts are in exposed places and it is necessary in many cases for the operator to work in close proximity to them. The brushes of burr pickers wear out rapidly, and they should be set up closer to the burr cylinders from time to time and ultimately replaced.

**26. Setting.**—In regard to the setting of the working parts of a burr picker, it may be stated that this depends largely on the character of the stock being run through the picker. For a coarse, long-staple wool, the burr cylinders may be set farther from the picker cylinder than for a finer and shorter wool, when they may be set up as close as possible without any contact. The burr guards should be set as close as possible to the burr cylinders without knocking out the wool as well as the burrs. If set too far from the burr cylinders, many burrs will escape them; while if set too near, they will pull the wool from the cylinder. Great care should be taken not to allow either the picking cylinder or the burr guards to touch the burr cylinders, since, if this is the case, the burr cylinders will be damaged and very soon ruined. The picking cylinder does not require to run very close to the burr cylinders, since the centrifugal force, due to its rapid rotation, will throw the stock from the picking cylinder into the burr cylinders. The brush should be set to strike into the burr cylinders slightly, so as to clear them thoroughly of wool. Care should be taken, however, that the brush does not strike the burr roll with any great force, as this will quickly wear



out the brush and necessitate its being replaced. Again, if set too close, there is a liability of the stock being carried around the brush.

**27. Gauze Room.**—The stock from a burr picker is delivered by the current of air generated by the brush to a gauze room. This is usually a wooden compartment provided with openings covered with wire screening, or gauze. The stock is blown from the burr picker to this room, the object of the gauze-covered openings being to let out the surplus air, but to retain the wool. Such machines as burr and mixing pickers, which deliver the stock by means of a strong current of air, require some such room in which to deposit the wool in order to collect it within a small space. The gauze room should be made large enough to accommodate a batch of wool easily, and should have a door of sufficient size to permit the easy removal of the cleaned stock. The door should have strong and suitable fastenings, and the openings in the room, which are covered with wire gauze to allow the egress of air, should be of sufficient area so that the efficiency of the current of air from the picker will not be impaired. If the gauze room is to be used for wool that is oiled in the burr picker, or for receiving the stock from a mixing picker, the floor of the room should be covered with tin, or preferably zinc, to prevent the oil from soaking into the floor. Care should be taken to prevent fire in a burr picker, or any similar machine that depends on currents of air for its operation, as nothing causes a fire to spread so quickly as an air-current.

**28. Calculations.**—The only calculations required in connection with a burr picker are those used in finding the speeds of the various parts, which may be readily done by means of the instruction previously given in regard to speed calculations.

# BURR PICKING

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## EXAMINATION QUESTIONS

(1) (a) What are the objects of burr picking? (b) What would be the result if the burrs were not removed?

(2) Give a description of the Parkhurst burr picker and its operation on the stock.

(3) Perform the calculations necessary to find the speed of the beaters on the Parkhurst picker.

(4) Suppose that it was desired to increase the speed of the rear burr guard on a Parkhurst picker to 1,700 revolutions per minute, what size pulley would be required on the rear burr-guard shaft?  
Ans.  $4\frac{1}{2}$  in. in diameter

(5) If the draft of the blower of a Parkhurst picker were not sufficient to draw off the dust and a 5-inch pulley should be placed on the blower shaft to remedy the defect, what would then be the speed of the blower?  
Ans. 1,530 rev. per min.

(6) Show the calculations for finding the speeds of the brush and burr cylinders of a Parkhurst picker.

(7) (a) How are the burr cylinders and guards in the Parkhurst picker exposed for cleaning? (b) Why are sliding brushes placed under the beater screens and over the screen at the rear of the picking cylinder?

(8) Are the burr cylinders placed in the same position regarding the picking cylinder in the Sargent picker as in the Parkhurst?

- (9) Explain the device by which the feed-apron and feed-rolls are stopped independently of the rest of the machine on the Parkhurst picker.
- (10) How does the arrangement of burr cylinders in the Curtis and Marble machine differ from other pickers?
- (11) What is the average daily production of a 48-inch Parkhurst picker?
- (12) Explain the difference between the steel-ring burr rolls and wire-wound rolls.
- (13) For what kinds of stock are beaters especially adapted?
- (14) What is the object of the steel straightedge shown at  $f_3$ , Fig. 3?
- (15) What can be said in regard to the management of burr pickers?