

The Hunter **COUNSELOR**

JANUARY, 1930

Contents

**Check Up Equipment As
You Check Up Styles**



**Style Consciousness In
Men and Its Effect
on Profits**



**Fundamental Principles
of Fulling**



What About Machine Costs ?



**Can You Full Ten Pieces
At a Single Set ?**

Founded



1847

Vol. 3

No. 7

Mill Operatives Designed This Cloth Washer

IF you use Cloth Washers and are planning to (a) expand present operations or (b) repair or replace present Washers, the improved Hunter Model G Cloth Washer will be of practical help to you. For these reasons:

The design of the Model G is the result of practice as opposed to theory. Hunter Engineers, discarding guesswork, went out into going mills and conferred with actual users of Cloth Washers. They consulted with mill superintendents and finishers and studied each problem separately. The result was the design of the Hunter Model G Cloth Washer, a machine practically designed by users themselves to fit practical needs; one that assures you

1. Proper running speeds so that no soap remains to harden fabrics
2. Washed Piece Dyes free of flakey or blotchy patches
3. Fancies that retain their original color and brightness
4. Heavily Milled Goods free of streaks or fold marks

The Model G offers a capacity range from 400 lbs. per load to 800 lbs. according to size—4½, 6, or 8 foot inside widths. Power requirements are low.

The Model G may be equipped with Chain Drives which we recommend. (Mills now using Hunter Washers can obtain Chain Drives for present machines.) The Chain Drive eliminates the old driving gear and pinion on the counter shaft and the long toothed connecting gear on the rolls. You thus minimize friction and vibration and materially lessen power and replacement costs.

LENGTHENS ROLL LIFE

The Chain Drive greatly lengthens Roll life. With gear drive it is necessary to reduce rolls 1 inch each time they are resurfaced to obtain proper size gears. This means carrying a stock of extra gears. These extra parts are eliminated with Chain Drives because if Rolls are resurfaced to the same diameter, the largest possible diameters can be used.

For complete information write for Bulletin No. 79

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Founded 1847
NORTH ADAMS, MASS.

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The HUNTER *Counselor*

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JAMES HUNTER MACHINE CO.

Founded 1847, NORTH ADAMS, MASS.

Being a magazine devoted to the Textile industry and a discussion of constructive ideas for the betterment of mill owners, agents, officials and operators in every department of the business.

VOL. III

JANUARY, 1930

No. 7

Check Up Equipment as You Check Up Styles

THE selling end of the mill maintains a pulse on the prevailing styles continuously. Yet, strangely enough the importance of a periodic check-up is not recognized by the production end of the business.

New fabrics, new finishes, new equipment are constantly being developed and the successful mill is abreast of the times in a mechanical sense as well as in a style sense.

The Engineering Departments of machinery manufacturers have always been available to the mill man for consultation and the making of tests. Possibly, these services have not been presented in such a way as to dissipate the suspicion that their sole purpose was to obtain sales information. Some mills, recognizing the value of a check-up every three or four months, have utilized the services of Hunter engineers for this purpose and established a practice of taking stock of their equipment every so often.

Aside from the fact that "a stitch in time saves nine," there is much value in discussing new developments and new policies. To take an instance as an illustration—a mill is functioning in a satisfactory manner yet feels that it would be desirable to have expert opinion on equipment. A Hunter engineer is called in, or if it were another department not dealing with preparation or wet finishing

ing, out of date? And even if you *don't* know, do you care?

Obviously, then, men's suits, coats, and so forth, are fundamentally staples, even though minor changes are now and then capitalized with a style appeal. That being so, let us note the tremendous gulch separating style and staple merchandise.

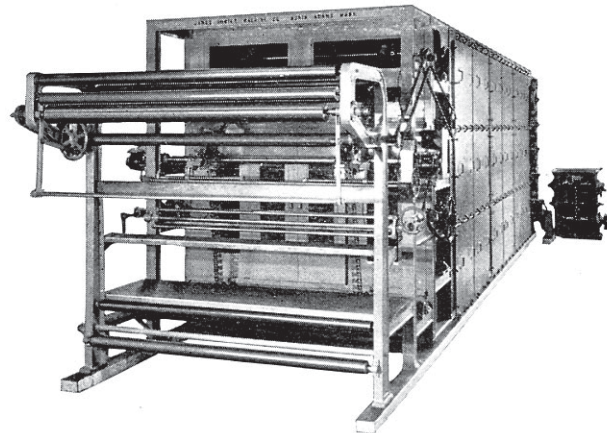
Staples are the product of mass production, mass selling, the machine and relative stability. On the style side, there is, as one writer puts it, "individualism, feast or famine, faith, hope, and sometimes a little charity." There is no such thing as stability.

If the men's clothing industry wants to make men style conscious, it must sooner or later cross the abyss between style and staple. And when it does bridge the chasm, it succeeds in staking millions in capital, plant, inventory, personnel, etc., upon a style market that changes its direction with disastrous rapidity.

Today the clothing manufacturer catering to men is relatively safe. He does not suffer any great losses during any given year because of style mistakes. He can order his fabrics six months in advance, make up suits in six or eight models, and, barring any bad business depression, he can market them. He is safe because at present the male is not concerned with style other than as a subject for wise-cracking.

Now the manufacturer wants to change this safe and fairly pleasant condition by making men "style conscious." The industry, egged on by the press and honey-tongued advertising experts, "yearns for the truly style-conscious male who will suddenly elect to wear velvet when manufacturers are loaded with woolens, who will demand silks when shirt factories are glutted with cottons, who will demoralize mass production and ruin the very power that gave him stylebirth."

A dire prophecy? Not at all. Such a condition—now so typical of the women's clothing industry—has existed before. Given the leisure, money, and



The New Hunter Tenter Dryer. Write for performance data and engineering proposal.

incentive, there is every reason why males should again become the colorful creatures God may have intended them to be. Wealth and leisure are common in America today. And if advertising and propaganda are strong enough to send a nation to war, they are powerful enough to make a man change the style of his clothes rapidly and with disastrous frequency.

In rebuttal the clothing manufacturers may say that there is no cause for alarm, and that they can always control the situation, that they can make men style conscious as they want them to be and no more so. Very good if true. But every business revolution has always taken place just as the situation was reported as "well under control," and be it noted, succeeded.

We think it better not to tinker with the golden goose, to risk the stigma of "to a conservative," for no group will be more painfully affected by a revolution in men's styles than the individual fabric-producing mill. The injection of a capricious style factor into their manufacturing layout at present is hardly the right physic.

The Fundamental Principles of Fulling

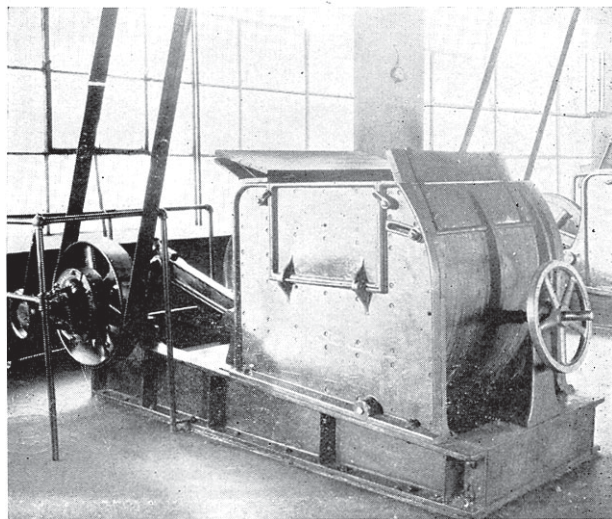
By DR. A. W. DAVISON

Rensselaer Polytechnic Institute, Troy, N. Y.

OUR present day fulling methods are clearly traceable to three distinct sources. In the first place, the germ of the procedure lies hidden way back in antiquity; no one seems to know how far, for the process in some of its aspects is a very old one. Someone, in those early days, discovered that cloth may be worked in the presence of certain softening agents, in such a manner as to shrink it materially, give it better body, build it into a more coherent entity, and at the same time enhance its physical appearance. The process was early called "finishing." This term, however, has since been broadened to include several other operations which it has been found desirable to perform upon the woven piece in order to improve its appearance and otherwise enhance its value. As the second origin of modern fulling practice may be listed the accumulated experience, skill, and ingenuity of the years which have passed since the first finisher put his discoveries to practical use. This period represents the trial by error age of woolen manufacture, in which countless experiments and tests were performed in a more or less haphazard manner, ever looking toward more satisfactory processes and more efficient machines. It is somewhat difficult to cite the exact date at which this trial-by-error period gave way to the era which many of us believe is destined to make the most valuable contributions to textile finishing; the period which may be aptly called the age of application of scientific methods and engineering skill to fulling, but certain it is that this third stage is upon us, for it has already contributed nobly to fulling practice, and we are optimistic enough to believe that better and bigger accomplishments lie just ahead.

In this scientific age, we are not merely content

to know that a thing is so; we are very much concerned to learn why it is so, and we are keenly interested in getting at the bottom of a process for the practical purpose of learning whether it may not be possible to accomplish the same, or better

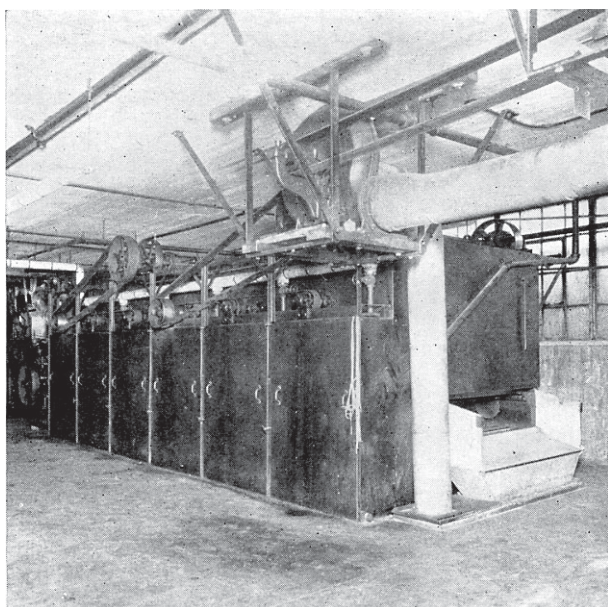


This Improved Kicker Fulling Mill Assures Better Finishing Effects. Write for Full Details and Performance Data.

ends, by other and more economical methods. This is the reason why we subject nearly everything under the sun to the closest scrutiny and analysis; ever bearing in mind that any improvements which we may introduce today may tomorrow be cast into the discard through the discovery of still more efficient processes. The world moves forward upon such applications of better ideas and principles.

In analyzing the fulling process, one discovers that there are three essential actions involved. Two of these are fundamental, and one incidental. The fundamental actions are: First, shrinkage of the fabric with respect to both width and length. This increases the weight per unit area and increases resistance to wear by crowding the material more closely together. It gives "body" to the fabric,

This Engineering Service Is A Guide to More Profitable Drying



Hunter 6 Section Agitating Table Dryer in a modern mill

IF yours is the mill faced with (a) the purchase or repair of Dryers, (b) the task of cutting Dryer costs, and (c) maintaining and improving quality in drying operations, *Hunter Dryer Engineers* may be able to find out for you *before you buy dryers*.

1. The type of dryer, which, when applied to your individual requirements, will produce the effect desired
2. Whether or not you can reduce present Dryer costs
3. The capacities you can get and at what cost.

All this before you spend a penny for new equipment.

Submit Your Problems

The James Hunter Machine Company has a group of Dryer Engineers who have passed upon many different dryer problems during the past 27 years. We offer this accumulated knowledge to textile mills, without obligation of any kind as follows:

On request (see attached coupon) Hunter Dryer Engineers will:

Hunter Proposal Enables You to Learn Exactly What Can Be Accomplished Before You Buy Dryers — Mail Coupon For Details

1. Make a study of your present equipment with a view to giving you comparative figures showing a dryer analysis of your fabric or stock as produced by a given Hunter Dryer and as produced by your present machines.
2. Where the data is insufficient we will make a test in your mill free of charge. Our recommendations, thus, being based on accurately determined facts, not only meet your most exacting *individual* needs, but show you what results can be accomplished, and at what cost. So before you spend money for equipment you know (a) the type of dryer best suited for you needs, (b) its cost to install and its operating costs, and (c) the best arrangement for auxiliaries to make your individual operation the equal of any in the field.

Fields Covered

Hunter Dryer Engineering Service in the textile field covers Air Systems, Wool Dryers, Apron Dryers, Agitating Table Dryers, Tenter Dryers, Cloth Dryers, Carbonizing Dryers, Cotton Dryers, Carpet Dryers, Special Dryers, Fans and Ventilating Systems.

On the above machines, Hunter Dryer Engineers are available for consultation, check-up, design, tests, and determination of the dryers best suited to your individual requirements. We invite your inquiry. There is no obligation of any kind, Mail coupon for further details.

JAMES HUNTER MACHINE COMPANY

Founded 1847

North Adams, Mass.

James Hunter Machine Company,
North Adams, Mass.

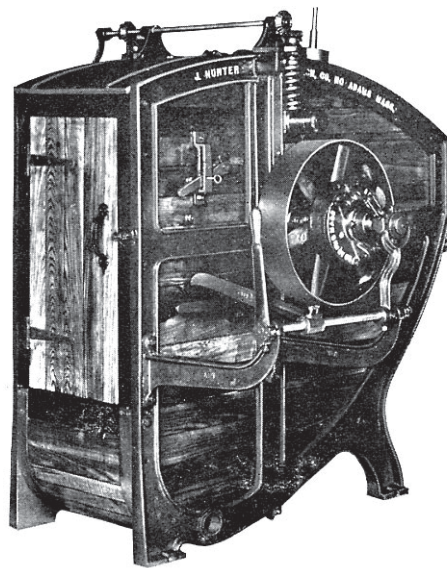
We are interested in more efficient drying. Please send us complete information on your dryer service. Data on present equipment is given below.

Present equipment.....
 Present capacities.....
 Material to be dried.....
 Capacities desired.....
 Name..... Title.....
 Mill.....
 Address.....

and, to a great extent, prevents undue shrinkage later when the fabric is in the hands of the wearer. Second, the individual fibers are caused to adhere to each other more or less completely, and thus form a mat. This action may be controlled at will, and there may be produced all gradients of matting, running from a slight effect, such as is produced in tweeds and homespuns, to dense matting, such as is produced in felts. This matting action is closely allied with the production of a velvet-like finish, the more it is effected, the "smoother" becomes the surface. The third primary action which takes place in fulling is scouring. This is incidental to shrinking and matting, but with modern trends in manufacturing, it is nevertheless an important factor in the operation of fulling mills. On certain classes of fabrics, an operation schedule can be laid out which will effect simultaneous fulling and scouring. This follows from the fact that judicious control of the process will finish the scouring operation before the required shrinking or matting effect has been produced.

Having analyzed the desirable actions which take place within the fulling mill, our next step is to attempt an understanding of why these actions take place. In order to do this, it is first necessary to investigate the make-up of the wool fiber, both from the standpoint of its physical structure and its chemical constitution. Students of animal physiology tell us that wool is a modified hair, and that it consists essentially of three distinct portions. At the very center of the fiber is found the medulla, or marrow (sometimes also called the core) which presents an irregular continuous structure. This portion of the fiber contains pigment, when the fiber is naturally colored. The medulla seems to possess only slightly, if at all, those properties which are recognized as being characteristic of wool. It may therefore be disregarded, so far as our present consideration is concerned. Surrounding the medulla, and making up the largest pro-

portion of the cross-section of the fiber, occurs the cortex. This has a well developed structure, being made up of a large number of elongated and often elliptical cells, clearly visible under high-powered magnification. These cells constitute the true wool substance, and contribute largely to those characteristics which all of us recognize as being



Hunter Sample Fulling Mill

Built on standard lines, with capacity of 65 lbs.; driven by friction pulley, 20" diameter, 4 1/4" face, 175 rev. per min. Is complete with packing boxes, stretcher, and stock motion. An excellent mill of small size for fulling samples at low cost.

possessed by wool. They particularly contribute to its tensile strength and its elasticity. The outside of the fiber consists of a very thin layer called the epidermis. This layer consists of flat scales, varying greatly in size and arrangement. These scales reinforce the fiber and give it great resistance to crushing. The number and arrangement of the scales are largely responsible for the luster of wool. When the scales are small, evenly arranged, and closely cemented down, the wool possesses

high luster, and when they are large, or are unevenly spaced, or protrude, the luster is impaired. Severe working of wool impairs luster by disarranging and even breaking off the scales. Alkalies cause them to become brittle, heat dries them and causes them to shrivel, oil tends to preserve them. The condition of these scales is responsible for the state of rigidity, or its reciprocal, pliability of the fiber. The phenomenon of felting, so characteristic of wool, is very closely allied with the structure and composition of the epidermal layer.

The knowledge of the structure of the fiber enables us to determine just which portion of the fiber is most responsible for each of the three actions of fulling heretofore enumerated. Shrinking is unquestionably a phenomenon to be associated with the cortical layer, since this portion makes up approximately seventy-five percent of the cross section and mass of the fiber, and is the determining portion, from the standpoint of tensile strength. Matting is entirely a characteristic of the epithelial scales, and of the whole fiber acting as a unit. The scouring action is properly not a function of the fiber at all but of the character of foreign material which happens to find itself upon the surface.

Now that we have investigated the physical characteristics of wool, it is in order to consider briefly its chemical constitution, for this has a decided bearing upon one's ability to understand the processes which take place in a fulling mill. When one determines the fundamental composition of carefully scoured and purified wool, and reduces the various percentages to a moisture-free basis, he finds that the entity is composed of five common elements, in the following average percentages:—

Carbon	50
Oxygen	24
Nitrogen	16
Hydrogen	7
Sulphur	3

100

Published tables of analyses show that the percentages may vary between fairly wide limits, depending upon the breed, season, origin of sample (from location on the pelt) climatic characteristics of country of origin, and type of feed consumed by the animal. While such a simple analysis does not show the types of compounds which exist in the fiber, careful research has developed the fact that there are a comparatively large number of complex chemical individuals present, all of them being unknown to the layman as individuals. The chemistry of the wool substance is extremely complicated, and is, at the present time, little understood even by professional chemists. Progress is being made toward its understanding, however, and we hope that practical results may come as we learn more about it. We are learning this much; many of the compounds which are present are chemical analogs of gelatine, although more complex.

Having outlined briefly a description of the structural, physical and chemical characteristics of wool, and having examined critically the processes which are known to take place during the fulling operation, we are now in a position to consider the fundamental characteristics of those operations which occur during the practical performance of fulling. This we will do in our next issue.

((H))

If, as the old saw has it, "human behavior is the basis of all business," Lord help the textile business. For who can foretell, one minute to the next, the whim of woman, the arbiter of textiles?

((H))

Low prices dig deep to open new markets, but cut prices dig deep the grave of profits.

((H))

Why is it that a man won't fight *for* things when he can find something to fight *against*?

What About Machine Costs?

SPEAKING before the American Association of Textile Chemists and Colorists, Mr. W. B. Lewis has this to say about American textile mills:

"If the engineer has any quarrel with the mill, it is because it is loth to improve the mechanics of its business and too frequently makes progress only when forced to by circumstances. Mills leading the procession are always a year or two ahead of their competitors in using the better way. And the leaders in any industry are usually the most prosperous. Cost and speed of producing are much more important factors than ever before. The order of the day is high labor cost with low selling price, and these two conditions can be met only through perfection of mechanical means."

What Mr. Lewis might have said is, "Competition today is far too keen to permit the waving aside of any machine improvement which reduces costs or makes quicker deliveries possible."

He might have said that one of the most important things that plant management can do today is to make, in conjunction with the engineer, a careful study of the relation between labor costs and machine costs.

Mildly surprising, perhaps, but it is not unusual to find on examination that machine costs are a more serious item than labor costs, though the two are closely related. It is not unusual to find tremendous wastes existing when a simple readjustment will change the condition. It is not unusual to find mill management harassed by high costs, totally ignoring the tremendous possibilities inherent in machine studies.

Take the matter of heat. Heat studies in actual mills have revealed some startling facts. Plants have been found operating 25 per cent of maximum, yet using enough heat to operate 75 per cent of maximum. This when a simple readjustment

could effect a radical reduction of heat, not only through departments, but in individual machines. True, heat is not a great percentage of the total cost to operate, but if that percentage is translated to dollars and cents, you will have something to think about. Five per cent or twenty-five per cent are worth saving when they represent \$10,000 to \$25,000.

There is the case of a boiler plant. Extreme, perhaps, but where the fixed and operating charges were ten to thirty times the labor charges. Yet an increased efficiency of 10 per cent would mean more than the elimination of all labor.

There is the matter of dryers. Are your machines giving high temperatures but ignoring the matter of vaporization and the speedy removal of moisture-laden air? A tenter dryer, for example, represents a comparatively large investment. What do you know about the percentage of heat losses through your present machines? Is its capacity limited by auxiliary machines? Does the manner of installation or type of construction of your dryers limit the production of the operator? Are you operating it to maximum speed, or do you have to shut it down every two or three weeks to repack bearings? Is your dryer production limited because your machines lack cut gears, ball bearings, and good foundation? The answers to a few of these questions will be revealing.

Consider fulling mills. Are you rumbling along with machines a quarter of a century old, fulling one or two pieces to a set, when recent fulling mill developments (see third cover page) make it possible to full ten pieces to a set? Or when one new machine will full 266 per cent more than four old type mills and in one-third less time? Do you know that one newly developed fulling mill, as a day's work, will full the daily output of 60 looms?

Through lack of proper machine study, it is not too much to say that many an efficient machine has been condemned. For example, a textile en-

gineer states that he was called in by a mill that was planning to duplicate a machine because it would not keep pace with production schedules. Study showed that new machinery was not needed. The old machine was found to be producing only 29 per cent of the time. Idle 71 per cent of the time because material flow to and from the machine was as antiquated as Watt's steam engine.

Again as witness to the value of machine study. There is a plant, possibly known to some readers of the *Counselor*, where miles of material travel have been reduced 75 per cent by a simple realigning of machines. We know another mill that formerly transported its goods fully one-fourth of a mile from the weave room to the finishing plant and hauled them back in dry form the same distance. A proposal to change the system met with the marked skepticism of the mill officials, yet when put into effect a 300 per cent annual savings in the cost of transportation resulted. Proper machine study means less closed doors, less liquidated assets, less disproportionate costs, and properly scaled selling devices.

It means less of the cynicism that prompted a mill owner to say, when asked what kind of plant he would build if he had \$500,000: "If I had a half million dollars and seriously proposed to build a new plant, I hope my family would lock me in a padded cell for the rest of my life."

((H))

"Every step any of us can contribute, this year or next, toward elimination of waste effort and unnecessary costs will help, not only toward an immediate and keenly competitive present, but toward that dim though certain future, when the strong man will work joyfully and even the weak will know no fear."

Kenneth Goode

How Many Strings Can You Full at One Set?

IF you use Fulling Mills compare the performance of the revolutionary, new Hunter Model 30 Mill with your present output:

1. On 14 oz. Top Coatings, 56 inches finished width, it has fullled the complete daily output of 60 looms in a single day. What is more, 10 pieces, 5 on a side, 58-60 yds. to the piece, were fed through the mill at a single setting.
2. Running 18 oz. Cotton Warp Top Coatings, 27 inches, finished width, the Model 30 Fulling Mill has fullled *266% More than Four Old Style Machines Can Full in the Same Time.* On this material it is fulling 8 pieces run three times through the rolls at a single setting.

The Model 30 Hunter Fulling Mill makes possible a uniformity of fulling never possible before. This because the Finisher can get so many pieces into the machine at a single set. For Piece Dyes alone its purchase is warranted.

WRITE FOR DETAILS

If you have not yet received details of this most revolutionary machine development, we invite you to write for detailed information. Tell us the types and weights of materials you are now running and your present fulling mill capacities. Our engineers will gladly show you by definite figures where and how the application of the Model 30 Fulling Mill to your individual mill will benefit you. They will tell you the exact advantage over your present equipment, at what cost, and what the probable profit will be. Write

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JAMES HUNTER MACHINE COMPANY
Founded 1847
NORTH ADAMS, MASS.

Fitting the Machine To Individual Requirements

TO THE mill troubled by machine inefficiency and high cost operation, to the mill whose machines do not give the output, the economy, or the exacting quality desired—a skilled Hunter Engineering Service offers much. As follows:

Hunter Textile Engineers are a group of men with an engineering background of 83 years of service to the textile industry. They are at the service of all mills to help them determine in advance of expenditure for new machinery (1) the type of equipment best suited for *individual* needs, (2) the best arrangement of auxiliary machines, and (3) the probable advantage over present equipment. We invite your inquiry, and there is no obligation.

Literature or definite information on any of the machines listed below will be mailed you postpaid on request.

PREPARATION MACHINERY

Wool Washers	Automatic Feeds
Wool Dryers	Stock and Rag Carbonizing
Wool Openers	Crush Rolls
Acidifying	Neutralizing
Wool Dusters	
Squeeze Rolls	

FINISHING MACHINERY

Soapers	Squeeze Rolls
Fulling Mills	Chinchilla Machines
Cloth Washers	Drying Systems
Piece Dye Kettles	Tentering Cloth Dryers
Automatic Crabs	

VACUUM EXTRACTING

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JAMES HUNTER MACHINE COMPANY

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