French Worsted Drawing

By Leon Faux

(A Series of Articles on French Worsted Spinning)

GRUEN INTERSECTING GILL-BOX.

Each of the two sets, upper and lower, consists of 22 fallers, of which 14 are constantly working on the wool. There are consequently 28 rows of pins in the wool, with a working height of .72 in., set 13.7 pins per lineal inch for merino wool. The fallers are .32 in. thick, and the two screws have a pitch of .36 in. and .72 in. respectively.

The slides being inclined as are those of the N. S. C. gill-

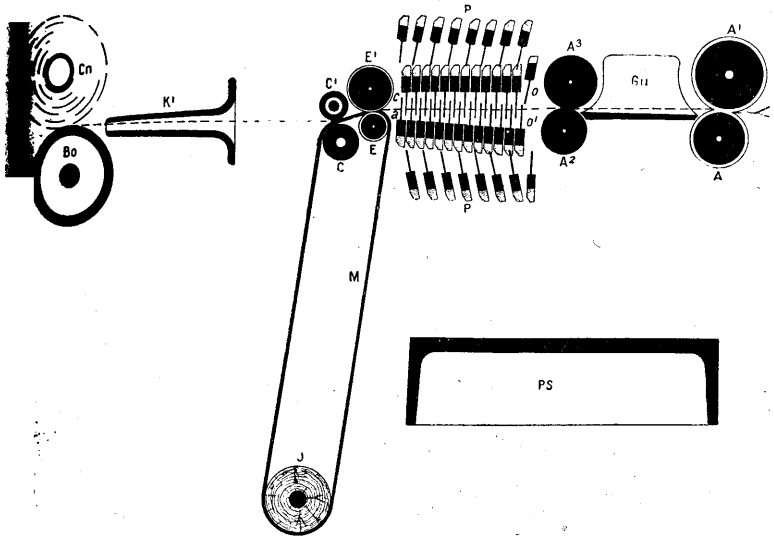

FIG. 111.—GRUEN INTERSECTING GILL-BOX.

box, the pins operate under the same conditions, that is with a progressive penetration.

To facilitate the removal of the wool from the drawing rolls and avoid the cutting of the leather apron M by reason

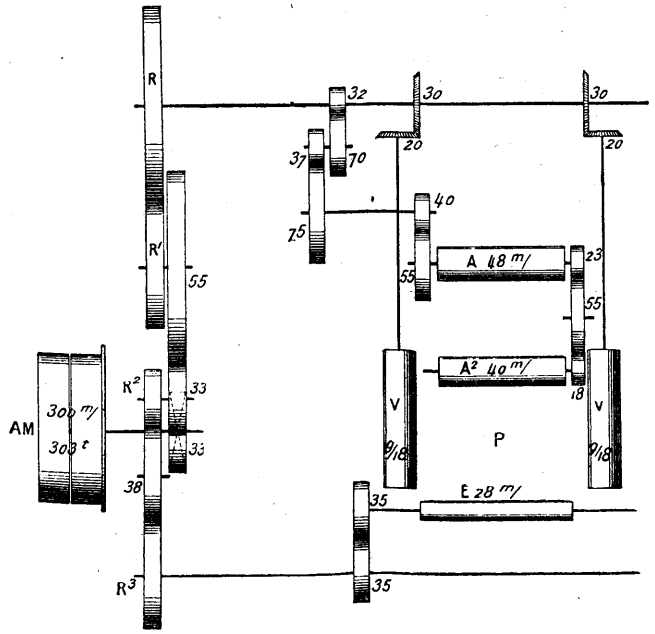

FIG. 112.—GRUEN INTERSECTING GILL-BO .

of the high pressures used and the small diameter, 1.12 in., of the drawing roll E, the apron M is guided and supported by the auxiliary roll C. This permits the removal of the fibers which remain stuck in the corrugations of the leather, and their normal delivery to the tube K^1. A stripping roll C^1, pressing lightly on and revolved by the apron M, keeps the upper roll E^1 free from wool.

DRIVING THE GRUEN GILL-BOX.

The drives for the feed rolls, drawing rolls and fallers are independent, this arrangement giving a wide capacity for adjustment.

The machine is run at a speed of 300 to 600 strokes of the fallers per minute, the screw turning 150 to 300 revolutions in the same time.

Referring to Fig. 112, the formula for the draft between the faller and the drawing roll is:

$([d\,E + 2\,M]\ 3.14 \times 20 \times R \times 55 \times R^2) \div (.72 \times 30 \times R^1 \times 33 \times R^3)$, or

$(1.36 \times 3.14 \times 20 \times R \times 55 \times R^2) \div (.72 \times 30 \times R^1 \times 33 \times R^3)$

The different drafts obtainable are given in Table XXIV. They vary from 3.37 to 13.4.

The surface speed of the drawing rolls per minute varies from 800 to 1250 inches per minute and is found by the following formula, assuming a speed of 303 r. p. m. for the driving shaft A M:

$303 \times (R^2 \div R^3) \times 1.36 \times 3.14$

The speed of the screws is found by this formula:

$303 \times [(33 \times R^1 \times 30) \div (55 \times R \times 20)]$

The lineal speed of the fallers is equal to the speed of the screw (r. p. m.) multiplied by the pitch (.72) of the working screw.

Table XXIV.

R	R^1	R^2	R^3	Draft
Fixed Speed for Drawing Rolls.				
52	25	33	24	13.40
"	26	"	"	12.82
"	27	"	"	12.40
"	28	"	"	11.90
"	32	"	"	10.40
"	35	"	"	9.58
"	36	"	"	9.30
"	37	"	"	9.05
"	38	"	"	8.80
"	39	"	"	8.60
"	40	"	"	8.35
"	41	"	"	8.19
40	44	"	"	7.60
"	35	"	"	7.40
"	36	"	"	7.20
"	37	"	"	7.00
"	38	"	"	6.80
"	39	"	"	6.63
"	40	"	"	6.49
"	41	"	"	6.30
"	44	"	"	5.10
Fixed Speed for Fallers and Feed Rolls.				
40	44	25	40	3.37
"	"	26	"	3.94
"	"	27	"	4.10
"	"	28	"	4.25
"	"	32	"	4.85
"	"	35	"	5.30
"	"	36	"	5.47