June 19, 1923. 1,459,352

C. APFFEL

KNITTING MACHINE

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FIG. 1

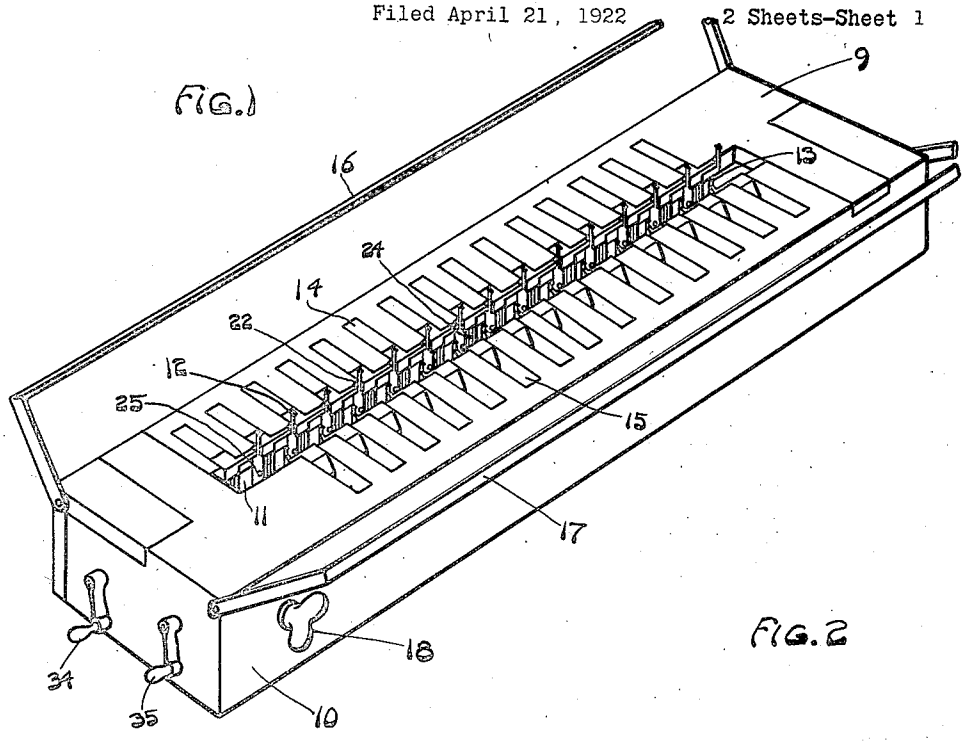
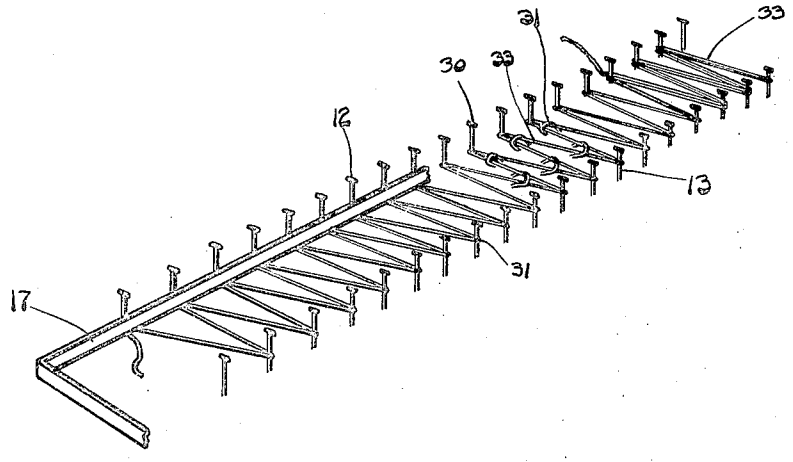


FIG. 2



INVENTOR

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FIG. 5

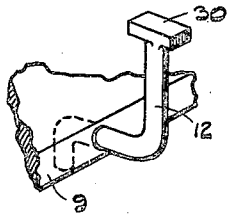


FIG. 6

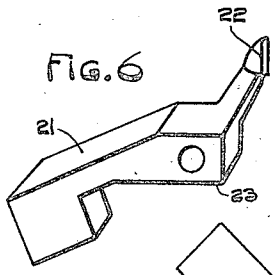


FIG. 3

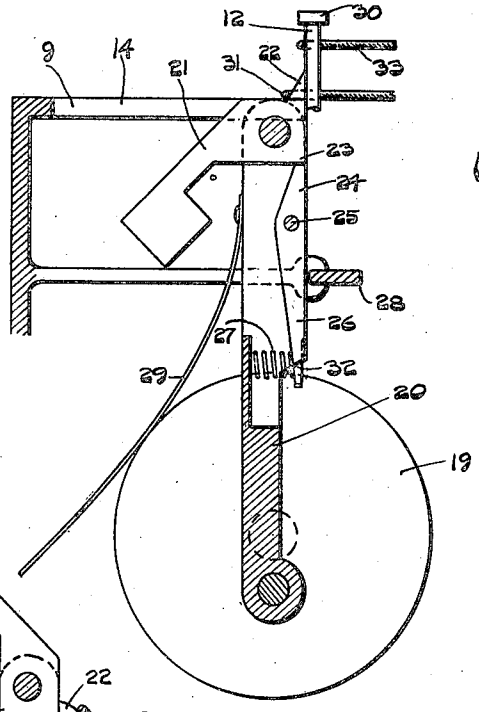


FIG. 4

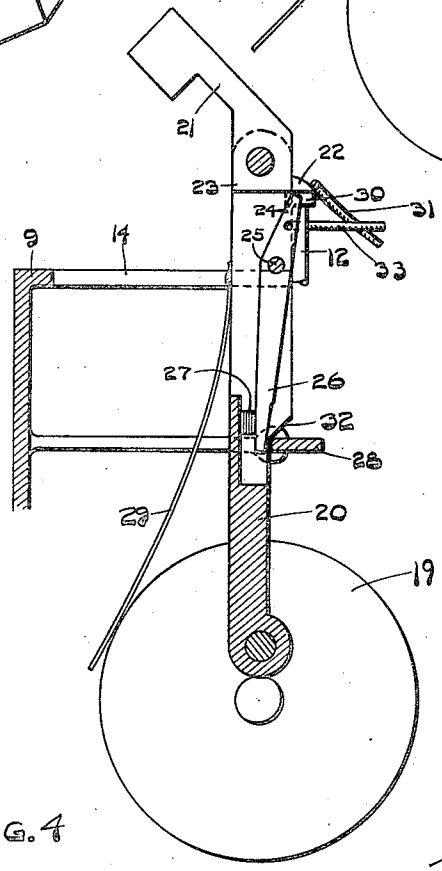


FIG. 7

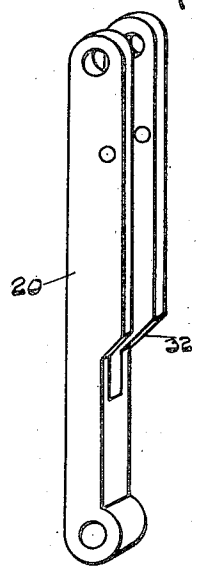
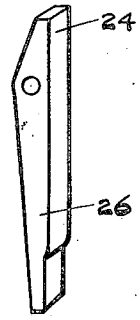


FIG. 8



INVENTOR

Charles Apffel

Patented June 19, 1923. 1,459,352

UNITED STATES PATENT OFFICE.

CHARLES APFFEL, OF CINCINNATI, OHIO.

KNITTING MACHINE.

Application filed April 21, 1922. Serial No. 555,810.

To all whom it may concern:

Be it known that I, CHARLES APFFEL, a citizen of the United States, residing in Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in a Knitting Machine, of which the following is a specification.

This invention relates to a knitting machine designed to produce articles of knitting apparel from yarn and similar material.

An object of my invention is to produce a machine designed to knit such articles as neck scarfs or mufflers and even to handle such larger articles as sweaters and the like when built of dimensions sufficient to accommodate them.

The machine herein disclosed is built to be of partially mechanical operation and manual operation in the knitting process.

In the drawings Fig. 1 is a perspective view of the machine upon a somewhat reduced scale.

Fig. 2 is a fragmental and substantially diagrammatic view of certain elements of the machine to illustrate the knitting operation.

Fig. 3 is a transverse and somewhat diagrammatic view illustrating the normal or inoperative position of the elements of one unit of the machine.

Fig. 4 is a view of the parts shown in Fig. 3, but showing them in extreme operative relation with each other.

Figs. 5, 6, 7 and 8 are perspective views of details of the machine.

The body of the machine consists of two relatively movable elements 9 and 10 which are so formed as to have a slot 11 between them for the purpose of allowing the woven fabric to pass downwardly and to hang beneath the machine, adjustability of the elements being controlled by screw 18. On the respective elements 9 and 10 are two series of headed pins 12 and 13 and between adjacent pins of each series short transverse slots 14 in element 9 and short transverse slots 15 in element 10. Pivoted at the ends of elements 9 and 10 are members 16 and 17 the use of which will be described later. At each of the pins 12 or 13 there has been provided a separate mechanism for manipulation of the yarn during the knitting operation. This mechanism is illustrated in Figs. 3 to 8 inclusive and a description thereof follows.

In its normal position the mechanism is shown in Fig. 3. A crank disc 19 is provided with a connected pitman 20, the upper end of which is provided with a pivotally mounted and weighted finger 21 having a tooth or detent 22 which is fitted to and lies adjacent to the pin 12 as shown. Beneath the shoulder 23 of the finger a pawl 24 is located and pivoted at a point 25 on the pitman. The lower end 26 of the pawl is pressed by a spring 27 against bar 28 extending longitudinally of the machine for each set of mechanisms. A spring 29 attached to the pitman and bearing against the periphery of the disc holds and presses the pitman against the bar 28. As the disc rotates, the pitman is lifted and as lifting takes place the upper end of the pitman moves away from the pin until the detent 22 is above the head 30 of pin 12. At this point a shoulder 32 which is provided on the pitman, allows the upper end of the pitman to move back again toward the pin 12 and simultaneously causes bar 28 to hit the lower end 26 of pawl 24. This brings the upper end of the pawl from beneath shoulder 23 of finger 21. The tension of the yarn loop 31 on detent 22 then causes the finger to be thrown up, as shown in Fig. 4, thus allowing the loop to slip quickly therefrom so that it is instantly removed by the retractile action of the loop tension, from the detent 22, the finger then being free to drop by gravity back to normal position. The slots 14 and 15 are provided to permit the weighted ends of the fingers to operate as shown. As soon as the above operation has occurred, the continued revolution of the disc will bring the parts to the condition shown in Fig. 1.

In carrying out the knitting operation I place the yarn upon the pins by zig-zagging it back and forth upon them as shown in Fig. 2. The members 16 and 17 are then brought down upon the loops of the yarn to force them over the detents 22 of the fingers into the position shown at 31 in Fig. 3. I then zig-zag another layer of yarn 33 upon the pins and after having done so, cause the discs 19 to rotate in order to throw the lower yarn loops 31 over the upper yarn loops 33 as shown in Figs 4 and 2. Thus the knitting operation is carried out, the fabric resulting therefrom passing downwardly through slot 11 of the machine by the pull of weights in the usual manner.

I have made the elements 9 and 10 relatively adjustable in order to accommodate varying thicknesses of fabric knitted from different weights of yarn, screw 18 having been provided for accomplishing this.

Another feature which may be incorporated is the provision of an operating means such as the cranks 34 and 35 which may be suitably connected with the discs for causing their rotation.

Having thus described my invention what I claim is:—

1. A knitting machine comprising a frame having a slot extending longitudinally thereof, pins extending along each side of the slot, and a mechanism for each pin, adapted to remove looped yarn from the pin, said mechanism consisting of a finger having a loop-engaging detent thereon, a pitman having the finger pivotally mounted thereon, and a crank adapted to transmit substantially circular movement to the lower end of the pitman, whereby the finger will be caused to move upwardly, away from and then toward the pin during its upward movement.

2. A knitting machine comprising a adjustable frame having a series of loop retaining pins thereon, and a mechanism for each pin adapted to remove looped yarn from the pin, said mechanism consisting of a finger having a loop-engaging detent thereon, a pitman adapted to mount the finger pivotally at its upper end, a rotating member to which the pitman is connected, adapted to transmit rotative movement to the lower end of the pitman, whereby the upper end of the pitman will give the finger an upward and downward movement combined with a movement from and then toward the pin during the upward movement, a pawl on the pitman adapted to retain the finger in normal loop-holding position until the upper limit of the movement of the pitman is reached, and means adapted to operate the pawl to release the finger at the upper limit of pitman movement.

In witness whereof, I affix my signature in the presence of two witnesses.

CHARLES APFFEL.

Witnesses:
JOHN SAUER,
JOSEPH A. SULLIVAN.