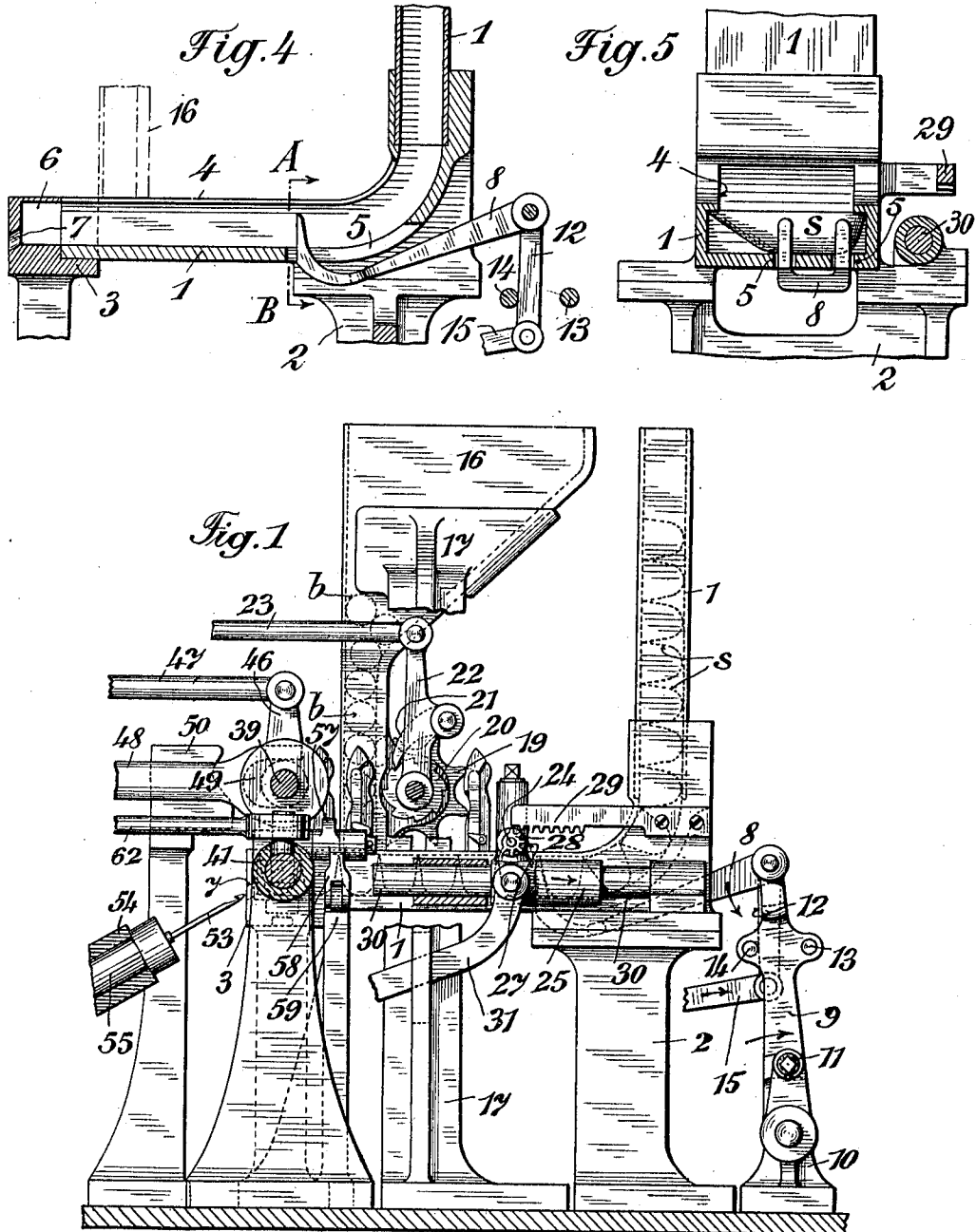


A. BLUM.
 FILLING MACHINE FOR EMBROIDERING MACHINE SHUTTLES.
 APPLICATION FILED SEPT. 20, 1909.

984,532.

Patented Feb. 21, 1911.

4 SHEETS—SHEET 1.



Witnesses:

Jesse H. Lutton.

B. Rommers

Inventor:

Albert Blum

by Henry Ott

Atty.

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4 SHEETS—SHEET 2.

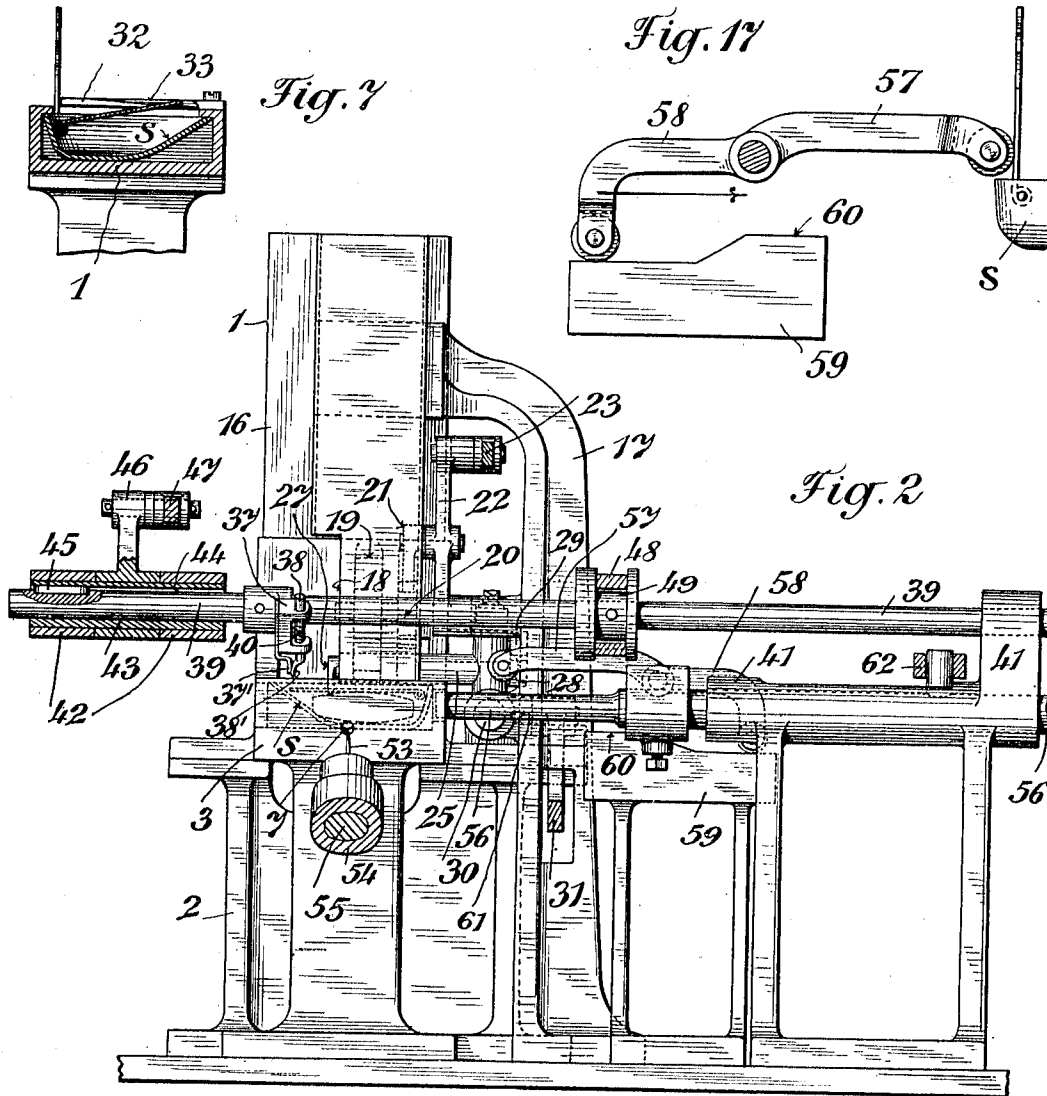


Fig. 17

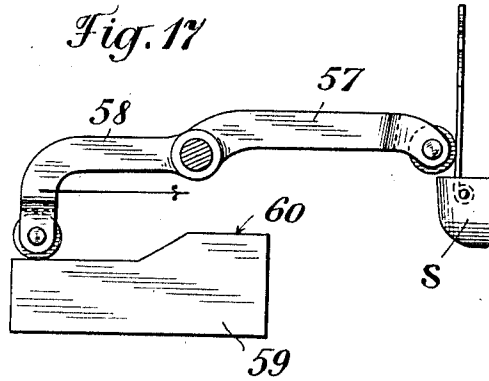
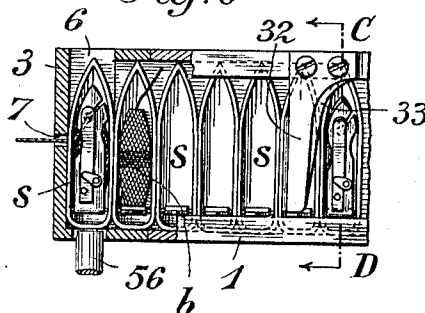


Fig. 2

Fig. 6



Witnesses:

Jesse H. Sutton.

B. Rommers

Inventor

Albert Blum

by Henry Orth

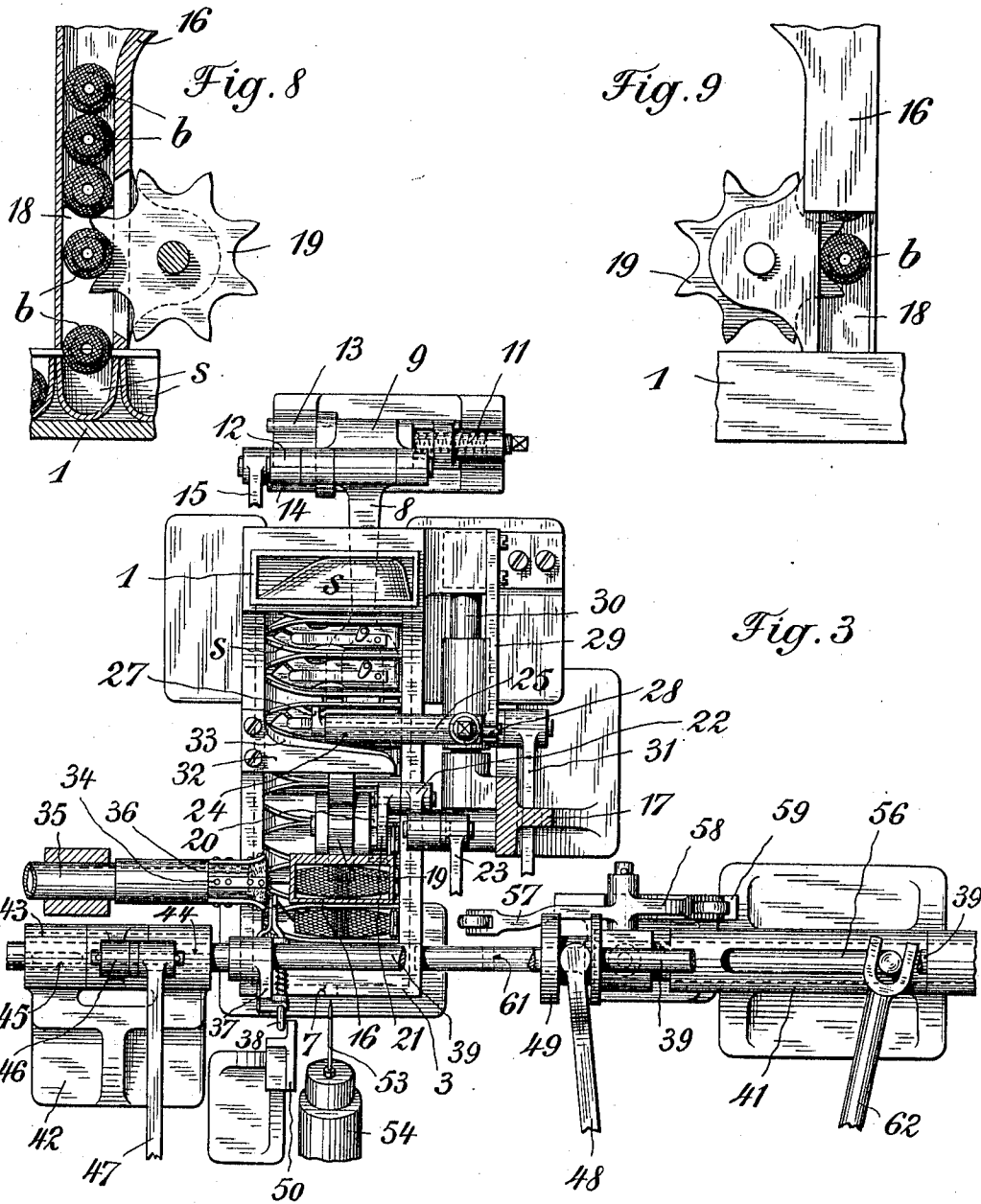
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4 SHEETS-SHEET 3.



Witnesses:

Jesse N. Lutton.

B. Rommers

Inventor:

Albert Blum

by *Henry Orth*

Atty.

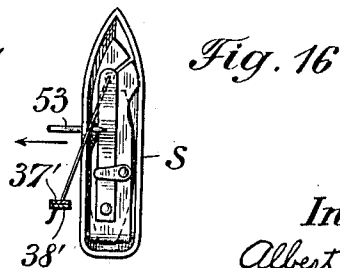
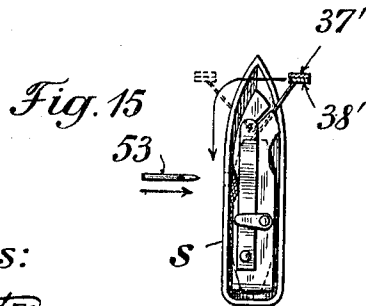
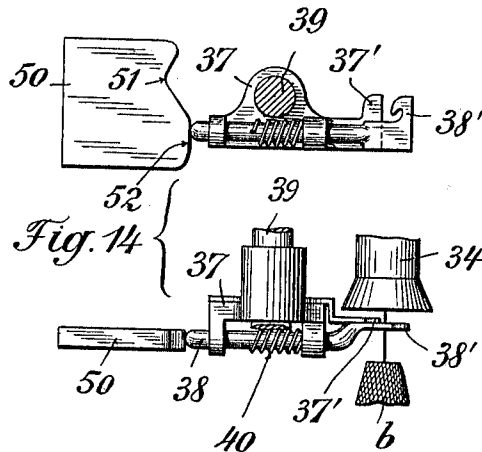
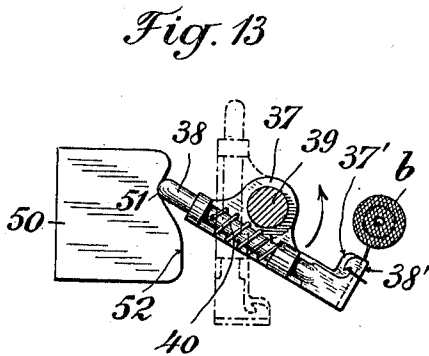
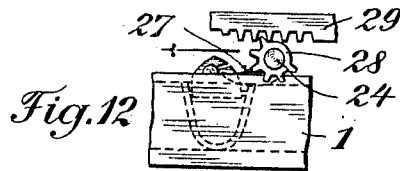
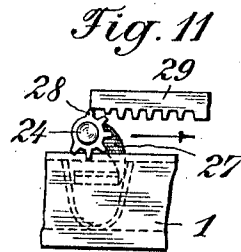
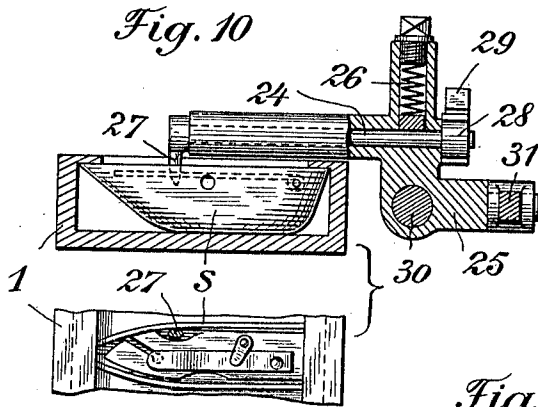
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Patented Feb. 21, 1911.

4 SHEETS—SHEET 4.



Witnesses:

Jesse M. Lutton

B. Rommers

Inventor:

Albert Blum

by Henry Orth
Att'y

UNITED STATES PATENT OFFICE.

ALBERT BLUM, OF RORSCHACH, SWITZERLAND, ASSIGNOR TO ALBERT CHARLES BOITEL, OF HERISAU, SWITZERLAND.

FILLING-MACHINE FOR EMBROIDERING-MACHINE SHUTTLES.

984,532.

Specification of Letters Patent.

Patented Feb. 21, 1911.

Application filed September 20, 1909. Serial No. 518,674.

To all whom it may concern:

Be it known that I, ALBERT BLUM, a subject of the Emperor of Germany, residing at Rorschach, St. Gallerstrasse 31^a, Switzerland, have invented certain new and useful Improvements in Filling-Machines for Embroidering-Machine Shuttles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The subject of my invention is a machine for filling the shuttles of embroidering machines. The new machine is furnished with a shuttle magazine and a bobbin magazine, which are so located relatively to each other that a bobbin leaving the bobbin magazine drops direct into an open shuttle located in the shuttle magazine.

A practical embodiment of the invention is illustrated in the accompanying drawings.

Figure 1 is a front elevation, and part section, Fig. 2 a side elevation and part section, and Fig. 3 a plan and part section, while Figs. 4-17 show details in various working positions.

The machine comprises five main parts, as follows: 1. The shuttle magazine with feed. 2. The bobbin magazine with feed. 3. The device for opening the shuttle cover. 4. The device for threading the shuttle. 5. The device for closing the shuttle cover and for ejecting filled shuttles.

I will now proceed to describe these mechanisms *seriatim*.

1. The shuttle magazine with feed.
(Figs. 1-5.)

The magazine consists of a channel 1, carried by the standards 2, 3, and presenting a vertical part for the reception of the empty closed shuttles, and a horizontal part for bringing the shuttles into the path of the bobbins leaving the bobbin magazine. The horizontal channel is provided above with an elongated opening 4 and below with two parallel slots 5. The opening 4 enables the shuttle cover to be opened and closed and the bobbins to drop into the shuttle, while the slots 5 admit the feed-lever to be

hereinafter described. The standard 3 is recessed at 6 to form a prolongation of the horizontal channel, and through this opening 6 the filled and threaded shuttles are ejected. 7 is an inclined hole conducting to the recess 6 and adapted to admit the thread-hook to be hereafter described, (Figs. 4-6).

The shuttles *s* lie in the channel 1 side by side with the point toward the back wall of the channel (as seen in Fig. 1) and with their slide-face upward in the horizontal part of the channel, directed toward the opening 4. The shuttles *s* are advanced by the above-mentioned feed device, consisting of an arm 8 whose forked end can enter the channel 1 through the slots 5 and insinuate itself between the shuttles. The arm 8 is pivoted in the forked end of a lever 9, which latter is journaled in a bracket 10 and is controlled by a lateral braking-spring 11 (Figs. 1 and 3). To the pivot of the arm 8 there is secured a lever-arm 12, which oscillates between two stops 13, 14, secured to the lever 9, and by means of a rod 15 receives a vibratory motion from an eccentric or the like (not shown in the drawing). The shuttles are fed forward in the following manner. At the commencement of the operation the lever 12, with the arm 8, is swung out of the position shown, in the direction of the arrow, so that the forked head of the arm 8 is retracted from the channel 1, out of the path of the shuttles; that is to say, the lever 12 strikes the stop 13 of the lever 9 (which has been retained in its left-hand position by the spring 11) and carries it in the direction of the arrow. On the succeeding vibration of the lever 12 toward the left, the arm 8 will be moved upward and its forked head enters between the shuttle which in Fig. 1 is shown as lying just rearward of it, and the preceding shuttle. The lever 9, owing to the action of the spring 11, remains in its right-hand position, but on the lever 12 striking the pin 14 it will be drawn toward the left, and the arm 8 will feed forward the shuttle, which lies in front of its forked head through the distance of a shuttle toward the left, that is to say, in the direction of the horizontal portion of the channel 1. Thereupon the arm 8 will be brought out of the path of the shuttles and the operation commences

anew. In this manner the shuttles will be advanced along the horizontal channel with intermittent motion, so that the pile of shuttles in the vertical portion of the magazine will descend by gravity in a continuous concatenation.

2. *The bobbin magazine with feed.* (Figs. 1-3, 8, 9.)

The magazine 16 is located above the horizontal portion of the shuttle magazine 1 and is secured to an upright arm 17. It consists of a hopper-shaped top portion and a vertical downward extension, which reaches to the top of the horizontal part of the shuttle magazine and is furnished in the back wall with an aperture 18 (Fig. 9) which extends down to the bottom of the magazine. The bobbin feed device consists of a toothed wheel 19, mounted at the level of the aperture 18 and protruding into the magazine through a slot provided for the purpose. On the axis of the wheel 19 there is mounted a ratchet wheel 20 with which there engages a feed pawl 21, carried by a lever 22 mounted on the arm 17. The lever 22 is connected with a rod 23, by means of which it is vibrated to and fro by an eccentric or the like, not shown on the drawing, whereby the wheel 19 is partly rotated.

The bobbins *b* lie in the magazine 16 in such manner that those ends from which there projects the inner thread-end which constitutes the commencement of the winding, is directed toward the back wall of the magazine. At each part-rotation of the wheel 19 two of its teeth will seize that bobbin *b* which is the lowest one of the pile in the magazine 16, and will lift and hold it so long at the level of the axis of the wheel (Figs. 1, 8 and 9) till the thread of the bobbin is stretched out straight by a device to be hereinafter described, and then gripped by nippers. On the next partial rotation of the wheel 19 the bobbin is released and will drop into a shuttle *s* which is located below, in open condition, ready to receive it (Fig. 8).

3. *The device for opening the shuttle cover.* (Figs. 1, 2, 10-12.)

This device consists of a horizontal shaft 24, which projects to some extent above the opening 4 of the horizontal part of the magazine 1. This shaft is mounted in a slide 25 and can turn in the latter against the action of a braking-spring 26, carried by the slide 25. The end of the shaft which is above the opening 4 is furnished with a nose 27, while the other end is provided with a mutilated pinion 28, which meshes with a rack 29, secured to the standard 2. The slide 25 itself is fixed to a rod 30, which is guided horizontally in front of the magazine 1 on the standards 2, 17. It is connected

with a rod 31, by means of which it receives a horizontal reciprocatory motion, together with the shaft 24, from an eccentric, or the like, not shown in the drawing.

Between the shaft 24 and the magazine 16 there is secured to the horizontal part of the magazine 1 a guide 32, which presents an inclined guiding-edge 33 that extends above the opening 4 (see Figs. 3 and Figs. 6 and 7, the latter of which is a section on the line C-D of Fig. 6).

The cover of the shuttles is opened in the following manner. At the commencement of the operation the slide 25, with shaft 24, is in its inward position, next the magazine 16, and the opener 27 protrudes into the aperture in the cover of the shuttle located below the shaft 24 (Figs. 10 and 11). If, now, the slide 25 is pushed into its outward position the opener 27, turning at the wall of the said shuttle, will bring the shuttle-cover out of the notch in the shuttle and lift it slightly. When the slide 25 has reached the end of its path, the mutilated pinion 28 engages the rack 29 (Fig. 12) and on return of the slide 25 into its inward position the shaft 24 with opener 27 will be turned by the rack, and the opener will thus be brought into the aperture in the cover of another shuttle (advanced simultaneously by the feed 8) partly by the motion of such shuttle. During the shifting of the opened shuttle its raised cover will strike against the edge 33 of the guide 32 and sliding along the same will be entirely opened, that is, brought into a vertical position.

4. *The device for threading the shuttle.*

The device comprises (a) the contrivance, for stretching the commencing-thread of the bobbin; (b) a pair of nippers which seize the said thread; and (c) the hook, which draws the thread through the hole in the wall of the shuttle.

a. The thread stretching contrivance (Fig. 3) consists, in well-known manner, of a hollow device 34, located opposite the aperture 18 in the bobbin magazine, which device is mounted on the likewise hollow, axially sliding and rotative shaft 35 and is provided internally, at its flaring front end with bristles 36. The device 34, while continuously rotating, moves toward the bobbin, held by the wheel 19, and taking over the free end of the bobbin presenting the commencing-thread, loosens the latter with its bristles 36, if the same has stuck to the bobbin. On return of the device 34 the initial-thread is carried along by the bristles, and kept stretched by a suction action produced in the hollow shaft 35 by a vacuum pump, or a fan, connected with the shaft.

b. *The nippers.* (Figs. 2, 3, 13 and 14.)—These consist of the two parts 37 and 38, of which the former 37 is secured to a shaft 39,

and is provided with a jaw 37¹. The part 38 is a pin, which slides on the part 37 against the action of a torsion- and pressure-spring 40 and is furnished with a hooked cheek 38¹. The two cheeks 37¹, 38¹ are pressed together by the spring 40 and thus constitute nippers (Figs. 13 and 14). The shaft 39 lies parallel with the hollow shaft 35 of the tension device 34; it can slide axially and the one end is guided in a support 41 and the other end in a bushing 43, which turns in a support 42. It can also rotate with the bushing, owing to the provision of a key 45 which is secured to the shaft and engages in a groove 44 in the bushing. This bushing 43 receives its rotary motion from an eccentric or the like (not shown in the drawing) with the aid of a lever 46 secured to the bushing, and a rod 47 connected with this lever. The axial motion is imparted to the shaft 39 by means of an eccentric or the like (not shown in the drawing) and a lever 48 which engages a flanged collar 49 mounted on the shaft 39. For the purpose of opening the nippers 37, 38 a stationary member 50 whose cam-surface 51-52 (Fig. 13) receives the end of the pin 38. The end of the thread of the bobbins is drawn below the spring on the shuttle-cover by the nippers, in the following manner. At the commencement of the operation the closed nippers 37, 38 are in front of the member 50, the pin 38 bearing against the curved part 51. If, now, the shaft 39 is turned in the direction of the arrow, Fig. 13, the nippers will open, the pin 38 ascending the elevated portion 52 of the member 50, and that thread, which is already held by the nippers, and has been introduced below the spring of one of the shuttles, is released. On further rotation of the shaft 39, with nippers, the latter will swing against the thread (held stretched by the device 34) of a bobbin lying at the bottom of the magazine 16 and retained in proper position by the wheel 19, which thread comes between the opened nippers, that is to say in the hook 38¹ (Fig. 14). The shaft 39, with nippers, is now pushed toward the support 42, the pin 38 leaving the member 50, the nippers being closed by the section of the spring 40, and the thread (which is in the hook of the cheek 38¹) being held fast between the two nipper cheeks, whereupon the nippers will be turned into the full-line position (Fig. 13). The bottom bobbin now leaves the magazine and drops into the shuttle below, which is advanced by the feed 8 through the distance of one shuttle. The nippers meanwhile remain in the position mentioned (Fig. 13) the thread coming into such position that it offers no obstruction to closing of the shuttle cover (Figs. 3 and 15), the latter being thereupon closed. Through the agency of the shaft 39 the nippers will now be swung

into the vertical position indicated in broken lines in Figs. 13 and 15, and the thread thus brought into the slot, and thus in front of the spring on the shuttle cover. Thereupon the shaft 39, with nippers, will be shifted in the direction of the support 41 and the thread thus drawn below the spring, into the province of the thread-hook (Fig. 16). After threading of the shuttle is completed, the nippers are again returned to their initial position opposite the member 50, and on rotation of the shaft 39 in the direction of the arrow in Fig. 13 are again opened, the thread held so far being now released.

c. The thread hook. (Figs. 1-3 and 16.)—This hook 53 is carried by a rod 55 and reciprocates in a stationary inclined guide 54, which is actuated by means not illustrated. It serves to draw outward through the hole in the shuttle wall the thread held by the nippers 37, 38 and brought below the spring of a filled shuttle. For this purpose it slides upward in inclined direction, passing through the hole 7 in the standard 3 and through the similarly inclined hole in the ejector to be hereinafter described, and through the hole in the shuttle wall, and on its return pulls the thread out through this latter hole, whereby the shuttle is threaded.

5. The device for closing the shuttle cover and for ejecting filled shuttles. (Figs. 1-3 and 17.)

On the axially sliding ejector-rod 56, which is mounted in the support 41 below the shaft 39 and parallel with it, there is fulcrumed a double-armed lever 57, 58, having a roller at each end. In the path of the lever-arm 58 there is provided a stationary member 59, presenting a cam-surface 60 (Fig. 17). The rod 56 is furnished at its front end with an inclined hole 61 for the entrance of the hook 53, and the rod receives its axial sliding motion from a lever 62, secured to it and actuated by an eccentric or the like, not shown in the drawings.

To eject a filled and threaded shuttle, the rod 56 moves toward the shuttle lying in the aperture 6 in the standard 3 and by entering this aperture knocks the shuttle out of the standard. Simultaneously with sliding of the rod 56 the arm 57 of the double armed lever 57, 58 flaps down the cover of the shuttle lying in the channel 1 adjacent to the ejected shuttle, that is to say, the second shuttle and on the arm 58 ascending the elevation 60 this other arm 57 presses the cover into the notch in the shuttle wall. The rod 56 does not now return, but remains at the level of the front shuttle in the magazine 1, for the purpose of holding the shuttle in its position, and preventing unintentional advance. In this position it will remain, in order to allow the hook 53

to pass through the hole 61 and withdraw the thread held by the nippers, whereupon the rod 56 will return to its initial position.

Thus the filling and threading of the shuttle is performed briefly as follows: The bobbin 7 which is bottom-most the time being, on operation of the wheel 19, drops direct into a shuttle 8, lying in the magazine 1 and already opened by the opener 27, the thread-end of this bobbin having been seized by nippers 37, 38 as long as the bobbin has been held by the wheel 19. The shuttle will now be advanced by the feed 8, and the cover closed by the double-armed lever 57, 58, and the thread-end of the bobbin drawn below the spring on the shuttle cover and then pulled out of the shuttle by the hook 53, that is to say, the shuttle is threaded. Meanwhile another bobbin has dropped into the next shuttle, lying adjacent to the first one, and on renewed action of the feed 8 the front shuttle will be brought into the aperture 6, in front of the ejector 56, which will knock it out of the magazine on its advance.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In a filling machine for embroidering machine shuttles the combination with the shuttle magazine presenting an open extension and means to feed the shuttles one by one, of a shuttle opener to open the shuttles as they are progressed along said open extension.

2. In a filling machine for embroidering machine shuttles, in combination, a bobbin magazine, and a shuttle magazine presenting an open extension, located below the exit of the bobbin magazine, along which the shuttles slide, whereby the contents of the bobbin magazine can drop into them, substantially as described.

3. In a filling machine for embroidering machine shuttles, in combination, a bobbin magazine, a shuttle magazine presenting an open extension, located below the exit of the bobbin magazine, and a shuttle-feed presenting a pivotal arm which enters the said magazine-extension from below and advances the shuttles under the bobbin magazine exit, substantially as described.

4. In a filling machine for embroidering machine shuttles, in combination, a bobbin magazine, a shuttle magazine presenting an open extension, located below the exit of the bobbin magazine, along which the shuttles slide, and means for opening the shuttles prior to their arriving below the said bobbin exit, substantially as described.

5. In a filling machine for embroidering machine shuttles, in combination, a bobbin magazine, a shuttle magazine presenting an open extension, located below the exit of

the bobbin magazine, along which the shuttles slide, a shuttle opener located above said extension and adapted to grip the shuttle cover, a reciprocatory and rotary shaft carrying said opener, and means controlling the exit of said bobbin magazine, whereby the bobbins are dropped intermittently into the uncovered shuttles, substantially as described.

6. In a filling machine for embroidering machine shuttles, in combination, a bobbin magazine containing superposed bobbins, a shuttle magazine presenting an open extension, located below the exit of the bobbin magazine and containing shuttles having a cover and a spring thereon and a perforated wall, means for intermittently advancing the shuttles along said magazine extension, means for opening the shuttles prior to their arriving below said bobbin exit, means for stretching the thread-end of the bottom bobbin in the bobbin magazine, means for seizing the so stretched thread of the said bobbin and after it has dropped into the shuttle below it and the latter has been closed, drawing it below the spring of the shuttle cover, and means for drawing the thread through the hole in the shuttle wall, substantially as described.

7. In a filling machine for embroidering machine shuttles, in combination, a bobbin magazine containing superposed bobbins, a shuttle magazine presenting an open extension, located below the exit of the bobbin magazine and containing shuttles having a cover and a spring thereon and a perforated wall, means for intermittently advancing the shuttles along said magazine-extension, means for opening the shuttles prior to their arriving below said bobbin exit, means for stretching the thread-end of the bottom bobbin in the bobbin magazine, nippers for seizing the so stretched thread of the said bobbin before the latter leaves the bobbin magazine, and after it has dropped into the shuttle below it and the shuttle advanced through a distance equal to the shuttle-breadth, and after the shuttle has been closed, drawing it below the spring of the closed shuttle cover, a hook for pulling the thread from below said spring through the hole in the shuttle wall, and means for releasing the thread, substantially as described.

8. In a filling machine for embroidering machine shuttles, in combination, a bobbin magazine containing superposed bobbins, a shuttle magazine presenting an open extension, located below the exit of the bobbin magazine and containing shuttles having a cover and a spring thereon, and a perforated wall, means for intermittently advancing the shuttles along said magazine-extension, means for opening the shuttles prior to their arriving below said bobbin exit,

means for stretching the thread-end of the bottom bobbin in the bobbin magazine, nippers for seizing the so stretched thread of the bobbin before the latter leaves the bobbin magazine and after it has dropped into the shuttle below it and after the shuttle has been closed, drawing it below the spring of the closed shuttle cover, a hook for pulling the thread from below said spring, through the hole in the shuttle wall, means for ejecting the first filled and threaded shuttle from the said extension, and means for closing the cover of the second shuttle during expulsion of the first shuttle, substantially as described.

9. In a filling machine for embroidering machine shuttles, in combination, a bobbin magazine containing superposed bobbins, a shuttle magazine presenting an open extension, located below the exit of the bobbin magazine and containing shuttles having a cover and a spring thereon and a perforated wall, means for intermittently advancing the shuttles along said magazine-extension, means for opening the shuttles prior to their arriving below said bobbin exit, means for stretching the thread-end of the bottom bobbin in the bobbin magazine, a rotative and axially sliding shaft, nippers mounted thereon the one member being fixed to said shaft, while the other member is hooked and is spring-actuated and slides upon the first member, and a stationary device presenting a cam surface upon which the second said nipper member bears on rotation of said shaft, whereby the nippers are actuated, a hook for pulling the thread from below the shuttle cover spring through the hole in the shuttle wall, means for ejecting the first filled and threaded shuttle, and means for closing the cover of the second shuttle during expulsion of the first shuttle, substantially as described.

10. In a filling machine for embroidering machine shuttles the combination with the shuttle magazine presenting an open extension; of a shuttle opener comprising a slide, a rotary opening member mounted in the slide, a mutilated pinion on said member, and a stationary rack in the path of the pinion.

11. In a filling machine for embroidering machine shuttles, the combination with the shuttle magazine presenting an open extension; and means for progressing the shuttles therein, of a shuttle opener to partially open the shuttle cover and stationary means in the path of the shuttle to complete the opening of the shuttle cover as the shuttle is progressed past said means.

12. In a filling machine for embroidering

machine shuttles the combination with the shuttle magazine presenting an open extension; of a reciprocable slide, a shaft mounted in the slide, a shuttle cover engaging nose on the shaft, a mutilated pinion on the shaft and a stationary rack in the path of the pinion and a stationary plate having an inclined edge to engage the shuttle cover after it has been acted upon by the opener to complete the opening of the shuttle.

13. In a filling machine for embroidering machine shuttles the combination with a shuttle magazine, of a shuttle ejector; of a shuttle cover closer coming into operation after the ejector and operating to close the cover of the shuttle adjacent to the one ejected.

14. In a filling machine for embroidering machine shuttles, the combination with a shuttle magazine; of a shuttle ejector having a hook passage therein, a shuttle cover closer operating later than the ejector to close the cover of the shuttle adjacent the one ejected and hold the shuttle and a hook operating to pass through said passage and shuttle to seize the thread to complete the threading of the shuttle before said shuttle is progressed to ejecting position.

15. In a filling machine for embroidering machine shuttles the combination with a bobbin thread end holder; of a rotatable and slidable shaft, a pair of cooperating thread seizing jaws thereon and a stationary cam into the path of which said jaws are moved to open them.

16. In a filling machine for embroidering machine shuttles, the combination with a bobbin thread holder; of a rotatable and slidable shaft, a jaw secured thereto, a spring actuated jaw mounted on and cooperating with the first mentioned jaw and having a pin extension, a stationary cam engaged by the pin during the opening of the jaws.

17. In a filling machine for embroidering machine shuttles in combination, a bobbin magazine, a shuttle magazine directly below the bobbin magazine, means for progressing the shuttles in the shuttle magazine, and means to permit the gravity discharge of the bobbins directly into the shuttles as they are progressed in their magazine beneath the bobbin magazine.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

ALBERT BLUM.

Witnesses:

HERMANN PEROF,
CARL CUBLER.