

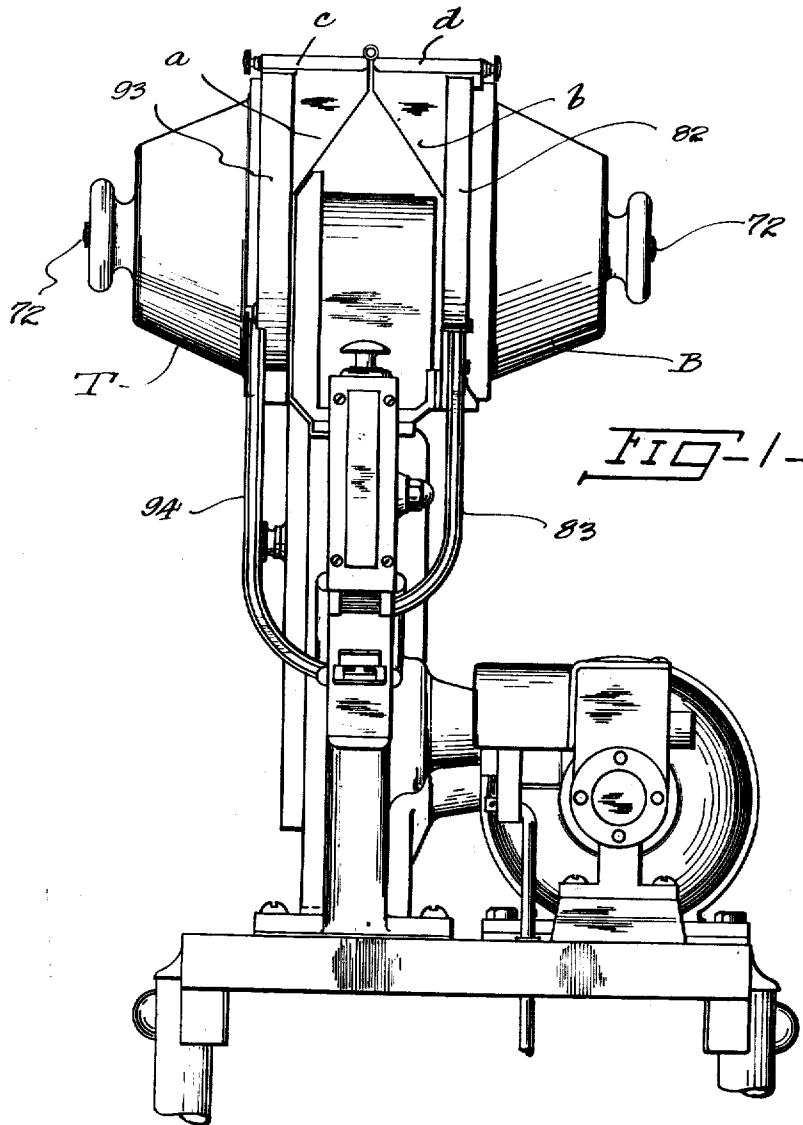
Nov. 9, 1926.

F. N. ROSS

1,606,185

HOPPER

Original Filed Oct. 10, 1924 3 Sheets-Sheet 1



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Frederick N. Ross

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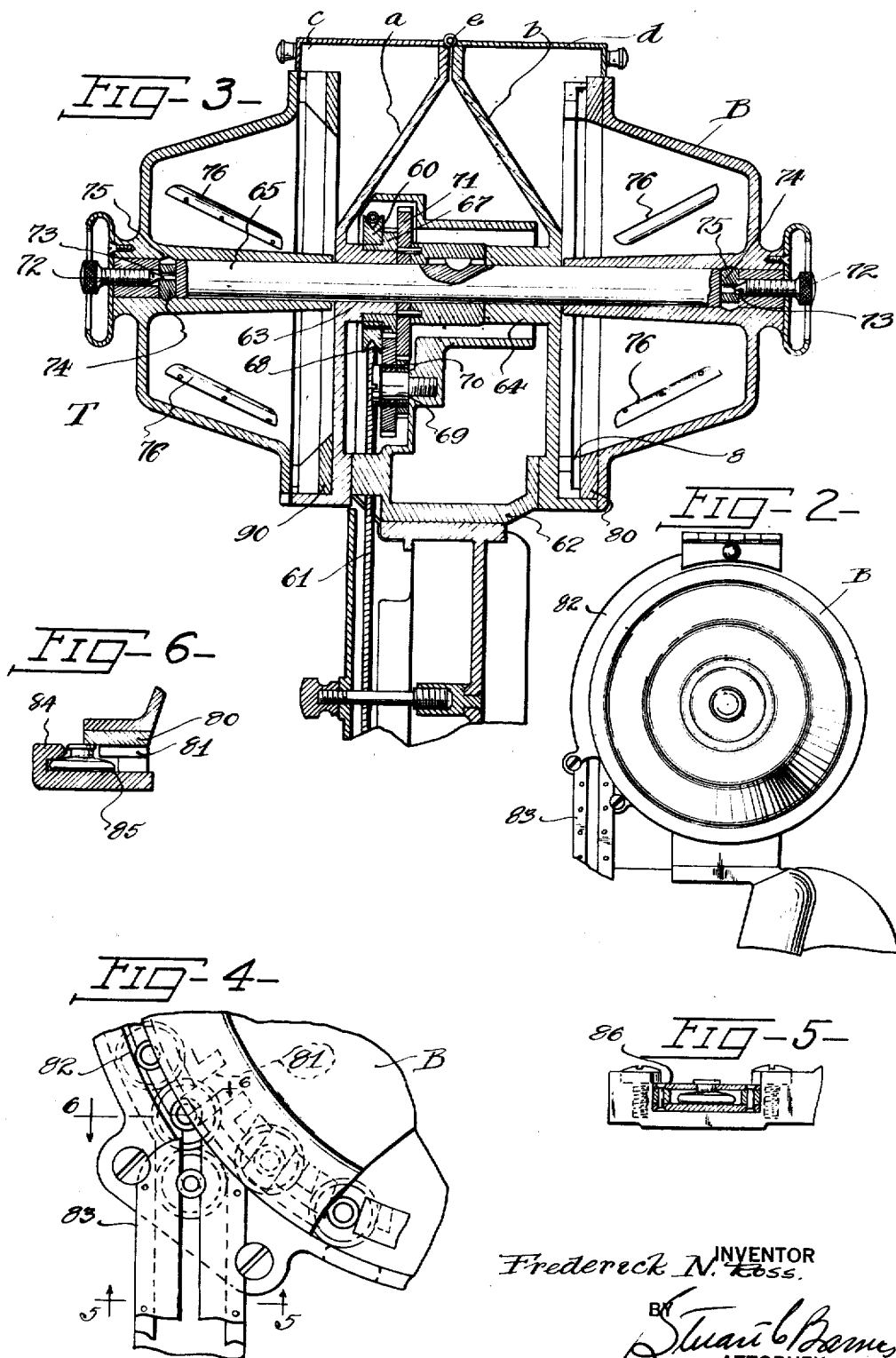
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HOPPER

Original Filed Oct. 10, 1924 3 Sheets-Sheet 2



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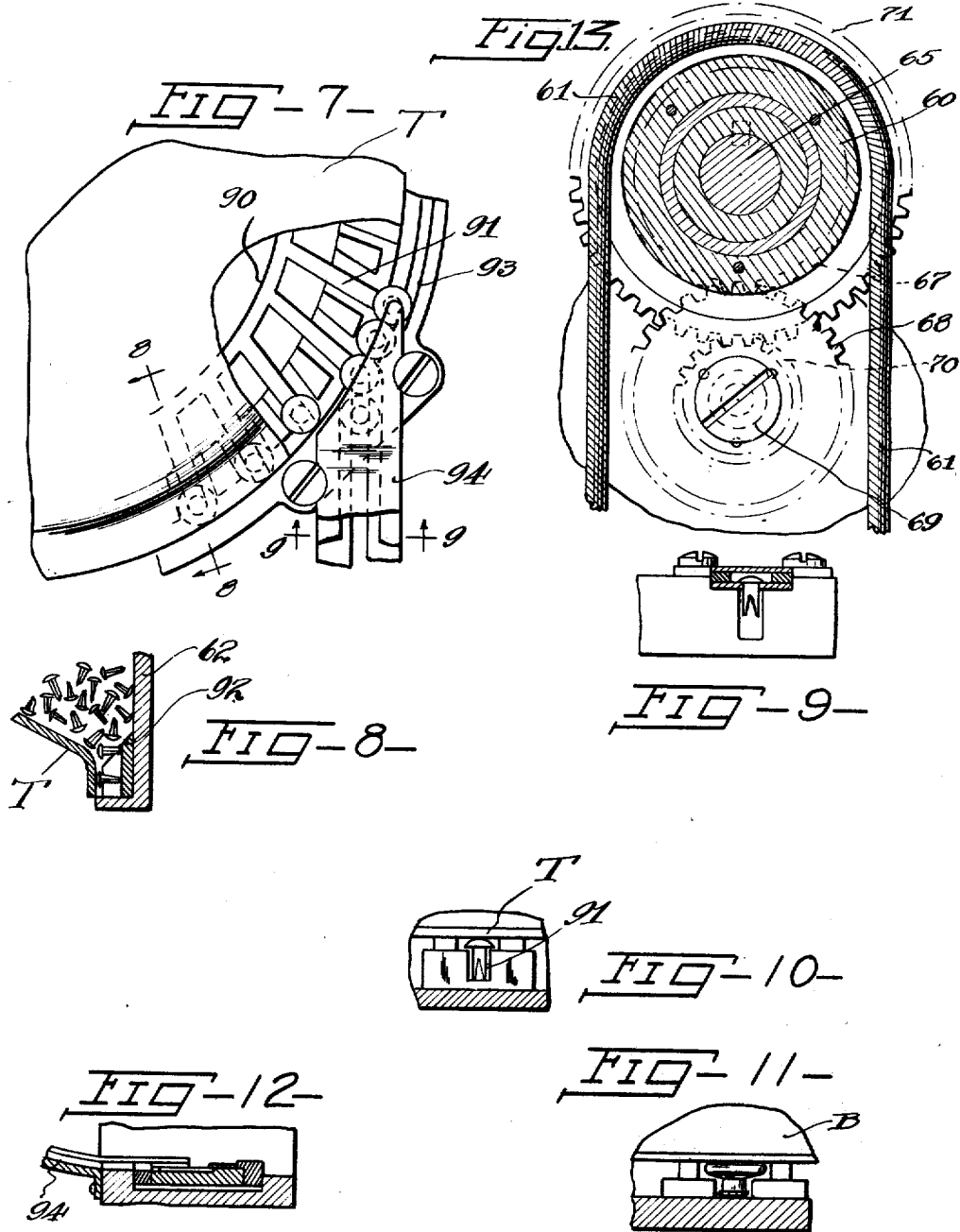
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HOPPER

Original Filed Oct. 10, 1924 3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

FREDERICK N. ROSS, OF DETROIT, MICHIGAN, ASSIGNOR TO BUTTON ATTACHING MACHINE COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

HOPPER.

Original application filed October 10, 1924, Serial No. 742,786. Divided and this application filed June 29, 1925. Serial No. 40,141.

This invention relates to a hopper for storing and feeding fastening devices such as tacks or buttons one by one in proper position, to mechanism which is adapted to fix the fastening devices together upon a piece of fabric.

This application is a division of my application filed October 10, 1924, Serial No. 742,786. The storing and feeding hoppers are obviously capable of a more extended use than in connection with the particular mechanism shown in my prior application. Therefore, this divisional application is filed, and therefore the mechanism below the button chutes is not shown in the present application.

It is the object of the present invention to provide storing and feeding hoppers which are operated by driving means turning in only one direction, but which, by reason of the yieldable driving connection, causes the tack hopper to oscillate back and forth when the power is suddenly disconnected, thereby securing a more effective agitation of the tacks than can be done by agitation continuously in one direction. The reason for this is obvious, for some of the interlocked masses can be quickly broken up only by a power exerted in the direction opposite to that in which the driving is done.

Another feature of the invention is that means is provided in one of the hoppers for reversing the tack heads to what would normally be the direction that the tack heads take in the hopper. This is advantageous in doing away with the necessity of one extra curve in the feed chute for properly positioning the tack with respect to the button. It is also advantageous in removing the massed heads of the tacks from the face of the stationary support that adjoins the hopper. These and other objects will be apparent from the description which follows.

In the drawings:

Fig. 1 is an elevation of a complete machine showing the hoppers in place.

Fig. 2 is an elevational view of one of the hoppers.

Fig. 3 is a vertical cross section through the hoppers.

Fig. 4 is a detail in elevation, fragmentary in character, of the button hopper, the raceway and the feed chute.

Fig. 5 is a section on the line 5—5 of Fig. 4.

Fig. 6 is a section on the line 6—6 of Fig. 4.

Fig. 7 is a detail, fragmentary in character, of the tack hopper, the raceway and the chute.

Fig. 8 is a section on the line 8—8 of Fig. 7.

Fig. 9 is a section on the line 9—9 of Fig. 7.

Fig. 10 is a fragmentary view, partly in section, looking at the edge of the tack-sorting ring.

Fig. 11 is a similar view taken with respect to the sorter ring of the button hopper.

Fig. 12 is a sectional view, showing the lower end of one of the tack chutes.

Fig. 13 is a detail showing the coiled cable drive for the button hoppers.

The tacks are fed into the funnel *a* and the buttons into the funnel *b* when the cover lids *c* and *d* are respectively lifted. These cover lids being pivoted on the same pintle *e*, obviously the two will not stay open at the same time unless designedly held open; consequently buttons cannot be spilled into the tack hopper and conversely, tacks into the button hopper.

The driving effort is obtained through a suitable driving belt 61. This belt is preferably formed of a close spring coil to provide an elastic driving connection, though it would be possible to use an ordinary non-elastic cable belt, if so desired. This elastic driving connection facilitates the agitation of the hopper contents. When the machine is in use it is being constantly started and stopped and this stopping of the machine which stops the driving shaft rather suddenly, will of course retard the rotation of the hoppers due to the elasticity of the belt; the same may stretch as the hoppers override the machine. This will cause the hoppers to oscillate back and forth and more thoroughly agitate the contents thereof. The belt 61 runs upwardly in the machine housing and is adapted to drive the button and tack hoppers B and T,—see Fig. 3. Secured to the machine housing is the hopper support 62 which is provided with suitable bearings 63 and 64, for rotatably supporting the shaft 65. The pulley wheel 60 is

rotatably supported by the hopper support and the belt 61 runs about this pulley wheel and drives the same when the machine is in operation. Pinned or otherwise secured to this pulley wheel is a gear 67, which meshes with the gear 68, supported on the short stud 69, rigidly carried by the hopper support. Pinned to the gear 68 is another gear 70, which meshes with the gear 71 which is keyed or otherwise secured to the shaft 65. It is plainly evident from Fig. 3 that this provides a speed reduction so that the shaft 65 is driven at a much slower speed. Secured at each end of the shaft 65 is a hopper, one of which is the button hopper B, and the other the tack hopper T.

I provide an easily operated means for quickly detachably securing these hoppers to the shaft. Screwed into the end of the shaft is a thumb screw 72, provided with a conical end 73, which engages a key 74, transversely and slidably supported in the shaft 65. As the thumb screw 72 is turned in, it will force the key 74 outwardly so that the same may bind in the groove 75 in the hub of each hopper. When the thumb screw is turned as far as it will go, it will bind this key in the groove, and thereby key the button and tack hoppers to the shaft 65, so that the said hoppers may be rotated when the machine is in operation. Secured to the interior of each hopper is a plurality of ribs 76, which will strike against the buttons or tacks which are contained within the hoppers for thoroughly agitating the same when the hoppers are rotated. I preferably form these ribs 76 of leather and rivet the same to the hopper and position the ribs at an angle of the central axis of the hopper. The soft pliable leather ribs render them adaptable to being secured to the hopper in such a position.

On the side of the hopper support, which is to support the button hopper, I provide a bearing for rotatably supporting a button ring 80, and the button hopper B is secured to this button ring. I provide a plurality of slots 81 (Figs. 4 and 6) milled through this button ring, said slots having a cross section approximating the cross section of the button which is forced therethrough. This button ring is provided about its periphery with a plurality of these slots so that as the hopper is rotated the buttons will be agitated and caused to slide through the slots 81 into the race-way 82 supported outside of said button ring. The button chute 83 is secured to the hopper support in such a way that the buttons when injected into the race-way are allowed to fall into the button chute and then fall by gravity into feeding position.

The race-way 82 is constructed in such a way (as shown in Fig. 6) that the button is guided by its neck. The race-way is pro-

vided with the projecting flanges 84, which are adapted to project under the clinching flange of the button to guide the neck while the passageway 85 in which the button head is supported, is of a greater width than the diameter of the button head so as to allow buttons of different sizes to be guided in the said race-way, as buttons having different size heads may be constructed with necks of the same diameter. Also, as shown in Fig. 5, the button chute 83 is provided with the guide plates 86, which are adapted to engage the button neck for guiding the same as the button falls by gravity down the chute.

At the side of the hopper support, to which is secured the tack hopper T, there is provided a bearing for rotatably supporting the tack ring 90, the tack hopper T being secured to this tack ring. Milled in this tack ring about its periphery is a plurality of T slots 91, more clearly shown in Fig. 10. The T slots are arranged so that the tack will fall therethrough with the head out and the prongs in. This tack ring is provided with a beveled inner surface 92, which co-operates with the conical formation of the hopper, as to cause the tacks to crowd into the lowermost point of the groove V formed by the inclined surfaces of the ring and hopper, thereby tending to keep the tacks away from the stationary hopper support 62, and allowing the ribs 76 secured in the interior of the hopper to agitate the cluster of tacks so that the same will fall through the T slots in the tack ring and enter the raceway 93, secured to the hopper support. A tack chute 94 is secured in such a way that it is in communication with the race-way 93 so that the tacks may fall into the chute and fall by gravity into feeding position.

The tack and button when they are assembled onto the fabric ready to be clinched together, have their heads on the outside. The conventional hoppers which guide the heads of both the tacks and the buttons, with either both heads towards the inside, or both toward the outside of the hoppers, will, when feeding the buttons and the tacks down through the chute, which simply curves under the button clinching mechanism, bring both tacks and buttons with the heads in the same position whereas they ought to be reversed. It is therefore necessary ordinarily to have an extra curve in one of the chutes to bring about this reversal. I secure this reversal by the V groove arrangement in the tack hopper which reverses the heads of the tacks and also at the same time keeps them out from the stationary support and prevents clogging.

What I claim is:

1. In a button attaching machine, the combination of means for operating said machine, a hopper for storing fastening de-

vices, and an elastic cable for connecting the hopper in driving relation with the machine operating means, whereby with the sudden stopping of the operating means, the elastic cable permits the hopper to rock freely back and forth for the purpose of agitating the contents of the hopper.

2. In a button attaching machine, the combination of means for operating said machine, a hopper for storing fastening devices, and means for connecting the hopper in driving relation with the machine operating means and including a coiled spring cable, whereby with a sudden stopping of the operating means the spring cable permits the hopper to rock back and forth to agitate the contents of the hopper.

3. In a button attaching machine, the combination of a hopper, means for rotating the hopper to agitate the contents thereof, a sorter ring secured to the hopper and provided with passageways to permit the passage of the member to be fed from the interior of the hopper to the exterior, and a stationary support for rotatably supporting the hopper and sorter ring, the said sorter ring and hopper joined together in such a way as to provide a trough, the bottom of which is remote from the face of said support for the purpose of removing the members from contact with the face of said stationary hopper support, the said passageways being in communication with said trough.

4. In a button attaching machine, the combination of a hopper for storing fastening devices, means for rotating the hopper to agitate the contents thereof, a sorter ring secured to the hopper and provided with passageways to permit the passage of the fastening devices from the interior of the hopper to the exterior, and a stationary support for rotatably supporting the hopper and sorter ring, the said sorter ring and hopper joined together in such a way as to provide a trough substantially V-shaped in cross section and the bottom of which is remote from the face of said support to remove the agitated fastening devices from contact with the face of said stationary sup-

port, said trough positioned circumferentially of the hopper and the passageways being in communication with said trough.

5. In a button attaching machine, the combination of a hopper, driving mechanism therefor, including a drive shaft, and quickly detachable means for connecting the hopper to said drive shaft in direct driving relation therewith and which also keys the hopper thereon against longitudinal movement with respect to said drive shaft.

6. In a button attaching machine, the combination of a hopper, driving mechanism therefor including a drive shaft provided with a movable gripping member, and means for moving said gripping member to engage the hopper for connecting the hopper to said drive shaft in driving relation therewith and to also key the hopper against longitudinal movement.

7. In a button attaching machine, the combination of a hopper, driving mechanism therefor including a drive shaft provided with a gripping member slidably supported thereby, and means for actuating the slidable gripping member to engage the hopper for detachably connecting the hopper to said drive shaft in driving relation therewith and to also positively key the hopper to said shaft to prevent longitudinal movement of the hopper on said shaft.

8. In a button attaching machine, the combination of a hopper, driving mechanism therefor including a drive shaft provided with a key transversely and slidably supported thereby, said hopper provided with a hub having an opening therethrough fitting over said driving shaft and having a recess therein, and a thumb screw for engaging the key, whereby the key is projected in said recess by turning up the thumb screw for the purpose of locking the hopper in driving relation to said driving shaft and to also positively key the hopper to said shaft to prevent the hopper from moving longitudinally with respect to said shaft.

In testimony whereof I have affixed my signature.

FREDERICK N. ROSS.

vices, and an elastic cable for connecting the hopper in driving relation with the machine operating means, whereby with the sudden stopping of the operating means, the elastic cable permits the hopper to rock freely back and forth for the purpose of agitating the contents of the hopper.

2. In a button attaching machine, the combination of means for operating said machine, a hopper for storing fastening devices, and means for connecting the hopper in driving relation with the machine operating means and including a coiled spring cable, whereby with a sudden stopping of the operating means the spring cable permits the hopper to rock back and forth to agitate the contents of the hopper.

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4. In a button attaching machine, the combination of a hopper for storing fastening devices, means for rotating the hopper to agitate the contents thereof, a sorter ring secured to the hopper and provided with passageways to permit the passage of the fastening devices from the interior of the hopper to the exterior, and a stationary support for rotatably supporting the hopper and sorter ring, the said sorter ring and hopper joined together in such a way as to provide a trough substantially V-shaped in cross section and the bottom of which is remote from the face of said support to remove the agitated fastening devices from contact with the face of said stationary sup-

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In testimony whereof I have affixed my signature.

FREDERICK N. ROSS.

DISCLAIMER.

1,606,185.—*Frederick N. Ross*, Detroit, Mich. HOPPER. Date of patent November 9, 1926. Disclaimer filed January 14, 1929, by the patentee, noted and approved by the assignee, *Button Attaching Machine Co.*

Hereby enters this disclaimer to claim number 5 in the said patent, the said claim being here quoted as follows, to wit:

"In a button attaching machine, the combination of a hopper, driving mechanism therefor, including a drive shaft, and quickly detachable means for connecting the hopper to said drive shaft in direct driving relation therewith and which also keys the hopper thereon against longitudinal movement with respect to said drive shaft."

[*Official Gazette January 29, 1929.*]

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