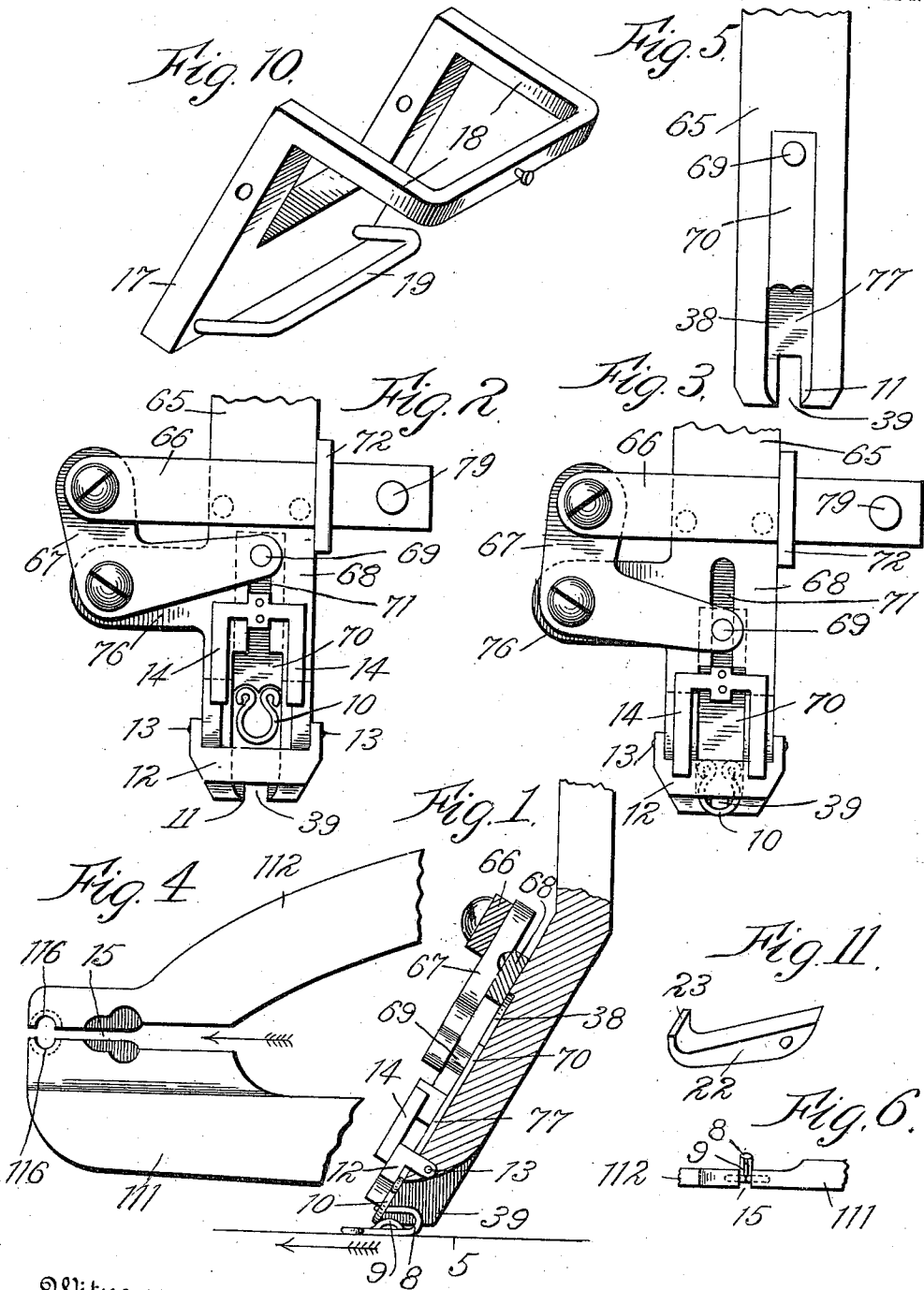


974,753.

Patented Nov. 1, 1910.

2 SHEETS—SHEET 1.



Witnesses:
 Herbert H. Knight
 F. M. Ryan

Inventor
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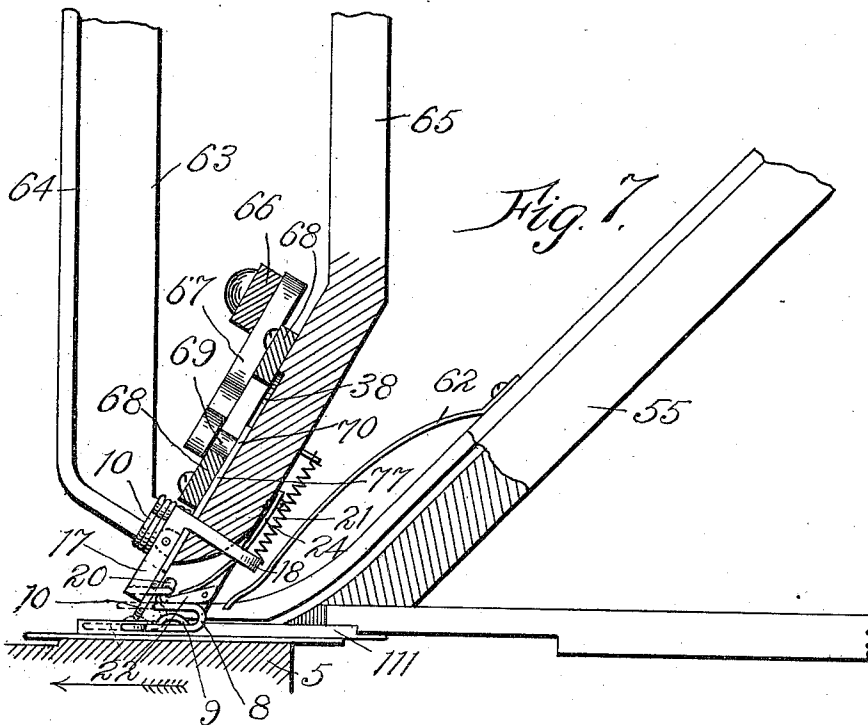
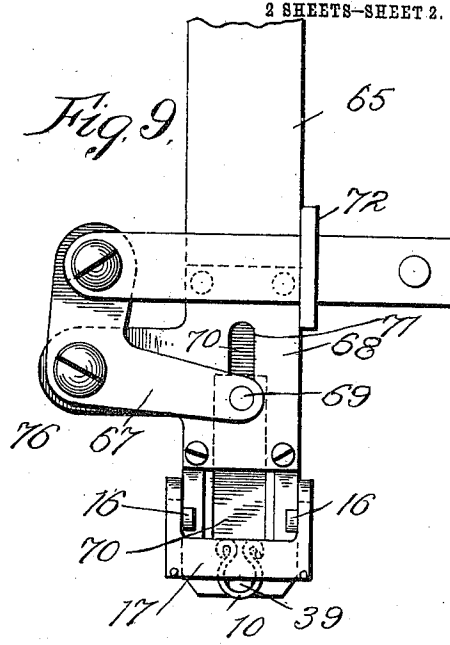
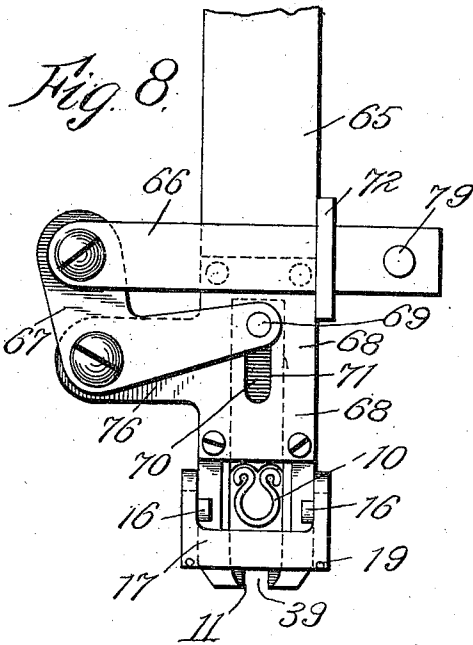
W. A. COURTLAND.
HOOK AND EYE SEWING MACHINE.

APPLICATION FILED FEB. 14, 1908. RENEWED APR. 5, 1910.

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2 SHEETS-SHEET 2.



Witnesses:
Herbert Knight
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UNITED STATES PATENT OFFICE.

WILLIAM A. COURTLAND, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE CONNECTICUT HOOK AND EYE COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

HOOK-AND-EYE-SEWING MACHINE.

974,753.

Specification of Letters Patent.

Patented Nov. 1, 1910.

Application filed February 14, 1908, Serial No. 415,960. Renewed April 5, 1910. Serial No. 553,556.

To all whom it may concern:

Be it known that I, WILLIAM A. COURTLAND, a citizen of the United States, residing in Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Hook-and-Eye-Sewing Machines, of which the following is a specification.

My invention relates in general to an improvement of the mechanism by means of which the hooks and eyes are engaged in the kind of machines above referred to, an example of which machines is shown, for instance, in the Patent No. 710,517 to George Rowbottom.

In the accompanying drawings I have illustrated my invention as applied to a machine of the kind above referred to, on which application for Letters Patent was made by Paul Ferdinand Kleinert, Serial No. 381,088. I have shown my improved mechanism particularly adapted in its form to fit the machine described in this application, but it is obvious that my device may be applied to the same advantage in any similar kind of machine.

The particular purpose of my invention is to engage an eye by a so-called "hump hook" with the hook at the time of engagement in its finished state. Heretofore it has been preferred, in order to engage an eye by a hump hook, to have the hook at the time of engagement in unfinished state, *i. e.* the bill of the hook slightly bent upward and not in parallel to the body of the hook as is the normal shape of these hooks, in order to cause the eye to easily slip without resistance to the back of the hook. To have the hook engage the eye in this unfinished state has been preferred, since heretofore difficulty has been incurred in holding the eye tight enough in its feeding device to pull it past the hump of the hook in finished form. Therefore, it was also usual, heretofore, to embody an additional mechanism in the hook and eye sewing machine to bend the bills of the hooks down in parallel with their bodies after the engagement with the eye. Owing to my improved device, this hook bending mechanism above referred to will be entirely omitted, the eye being held positively fast in its hook engaging position at the moment it engages with the hook and slips past its hump, while the

tight hold of the eye feeding mechanism on the eye is released as soon as the eye has slipped past the hump, so that the hook can then pull the eye from its feeding mechanism.

I have illustrated in the drawings two modifications. In one modification the means for holding the eye tight in its engaging position while the hook passes with its hump, are controlled by the eye-feeding means; while in the second modification the means for holding tight the eye are controlled by the passing hook, *i. e.* as long as the hook is in its engaging position tending to pull the hump past the eye, it locks automatically the means for holding tight the eye and unlocks these means only after the hump has passed the eye.

In the drawings: Figure 1 is a side elevation of a part of an eye feeder similar to that shown in the patent above referred to, shown partly in section; Figs. 2 and 3 are front elevations thereof, showing the pusher finger for the eye in different positions; Fig. 4 is a plan view of the front part of a hook gripper as employed, for instance, in the patent above referred to for transferring the hook from the hook slide to the cards, causing on its way to the cards the hook to engage the eye; Fig. 5 is a detail front view of the main body of the eye feeder shown in Fig. 1 in side view and also showing the eye pusher finger withdrawn; Fig. 6 is a front view of the gripper shown in Fig. 4; Fig. 7 is a side elevation of a modification of the form shown in Fig. 1 also partly in cross-section; Figs. 8 and 9 are front elevations thereof; Fig. 10 is a detail view of the frame shown in Fig. 7 holding the eye on its seat while engaged by the hook; and Fig. 11 is a detail view of the latch operated by the hook while engaging the eye to hold it tight in its seat.

In Figs. 1, 2, 3, 7, 8 and 9, 65 is the main body or bar of the eye feeder, which is suitably fastened to the machine frame (not shown here) and extends downwardly, approaching sewing table 5 (Figs. 1 and 7) at a suitable angle shown in these figures. The upper side of the end of bar 65 is provided with a recess 38, adapted to receive a slide 70, as shown in detail in Fig. 5, and is further provided at its end with a slot 39, shown in Fig. 5 in plan view and in Figs. 1 and 7

in side view. The recess 38 which receives slide 70, is covered by plate 68 provided with a slot 71 through which a pin 69, fastened on slide 70, protrudes. Side arm 76 of plate 68 carries pivoted to it bell crank 67, one arm of which engages pin 69 of slide 70, while the other arm is pivoted to a slide 66, moving transversely to bar 65 in guide 72. Slide 66 is suitably connected to the mechanism operating the eye feed at the proper time, which mechanism is not shown in the drawings, since it does not pertain to the subject matter of my invention. Plate 68 covers recess 38 only partially, *i. e.* far enough to form a guide for slide 70, leaving the lower portion of recess 38 toward the end of bar 65 open, so that the eyes 10 which have straddled down on the bead 64 of eye rail 63 (described in the patent above referred to) may enter recess 38 in front of slide 70, guided by the end of eye rail 63, which extends close to recess 38 (Fig. 7). Recess 38 is deep enough to hold just one eye, and slide 70 is suitably shaped at its end to fit the sewing eyes of the eye, as shown in Figs. 2, 5 and 8. When slide 70 is withdrawn, as shown in Figs. 2 and 8, an eye will drop from the rail 63 (Fig. 7) into recess 38 and rest at the bottom 77 of it until slide 70 is operated at the proper time to push the eye to its seat 11 at the end of the recess. This position of the slide and the eye is shown in Figs. 5 and 9. When the eye is in this latter position, a hook delivered by the hook chute 55 (Fig. 7), of a similar form to that described in the patent above referred to, will be taken along (in the manner also described in said patent) by gripper arms 111 and 112 (Figs. 4 and 7) and fed forward in the direction of the arrow shown in Figs. 1, 4 and 7, the hook being in such a position that, when passing with its bill through slot 39, at the end of bar 65, it will engage the eye as shown in Fig. 1. When the hook 8, thus fed, is moved further in the direction of the arrow it will pull the eye 10 (Fig. 1) from its seat and carry it along.

In case of the so called "hump hooks," the yielding hump 9 of which forms means for preventing the eye slipping from the bill when used on garments, the hump 9 would prevent the eye from slipping back past the hump into its place where it should be when the pair of hooks and eyes is sewed onto the card, since the hold which the eye 10 has on its seat 11 when engaged by the hook is not strong enough to cause the hook to pull the hump past the eye without lifting it prematurely from its seat.

Various means have been provided to hold an eye in this kind of device on its seat. These means, however, are not positive enough to withstand the pull of the hook to get the eye past the hump. I have now pro-

vided positive means which normally will allow an eye to rest loosely in its seat, so that it can be pulled easily therefrom when engaged by a hook; which means, however, will hold the eye positively tight to its seat during the engaging operation with the hook and in particular during the time the eye slips past the hump, and which will release the positive hold on the eye as soon as it has been fully engaged by the hook. For this purpose I have provided near the end of bar 65 a shield 12, which is pivoted to the bar at 13 (Figs. 1, 2 and 3). The main portion of this shield extends transversely to recess 38 of bar 65, thus covering part of the lower end of this recess, leaving however, the seat 11 of the eye uncovered (as shown in Figs. 2 and 3), so that if an eye 10 has been delivered to this seat (Fig. 3) sufficient space will be left for the bill of the hook to slide through the eye. It will be seen from Fig. 1 that shield 12 is pivoted so to bar 65 that when an eye is pulled by the hook from its seat after it has been fully engaged, shield 12 will tend to rock upward.

In order to prevent the upward rocking of shield 12, and thus the removing of the eye from its seat when the hump 9 of the hook is about to pass the eye, the following means are provided: On slide 70 is fastened the U-shaped fork 14, the two prongs of which are of suitable length so as to leave shield 12 uncovered when slide 70 is withdrawn the farthest (Fig. 2), but to cover shield 12 and prevent it from rocking upward when slide 70 has been pushed forward to locate an eye in its seat. If shield 12 is thus covered by the two prongs of fork 14, hook 8 in engaging the eye and pulling the hump past the eye will be unable to lift the eye from its seat. The machine in which this device is embodied is timed so that the prongs of fork 14 will cover shield 12 at the moment the bill enters the eye and will be removed from it as soon as the hump has been pulled past the eye, so that shield 12 is again free to rock upward, and so that the hook can pull the eye, which is now fully engaged, from its seat. At the moment when the eye is pulled past the hump, the latter will yield in a downward direction and will thus protrude at the under side of the hook body. In order to allow the yielding of the hump in the downward direction the gripper arms 111 and 112 are so formed, to leave when gripping the hook, a slot 15 between (Figs. 4 and 6), into which the hump protrudes when yielding.

In Figs. 7, 8, 9, 10 and 11 I have shown a modification by which the same purpose may be obtained as by the modification just described. Instead of pivoting a shield 12 in the manner described above, I have provided lugs 16 on the upper side of bar 65, one on either side, in which a shield 17 of

the form shown in Figs. 7, 8 and 9 is pivoted. This shield runs transversely to recess 38 in the same manner as shield 12 described before, and is also adapted to normally yield when an eye is pulled by the hook from its seat 11. On this shield is provided a portion 18 which encircles bar 65 on the under side. The shape of shield 17 is more clearly shown in perspective view in Fig. 10. At the lower end of the shield is provided a loop 19, also extending rearward similarly to portion 18 of the shield and having its main portion running in parallel to the shield and disposed in a slot 20, running transverse to bar 65 (Fig. 7), which slot is of sufficient width to allow of the rocking of shield 17 in its pivots when the eye is pulled from its seat by the hook. To the portion 18 of the shield extension, running in parallel to the shield, is connected a spring 21 fastened at the other end to bar 65 in order to keep shield 17 yieldingly resting over the eye seat. Within the lower end of bar 65 is further pivoted a latch 22 (a detail perspective view of which is shown in Fig. 11) so that its upward extending hook 23 is adapted to engage loop 19 when the latch is thrown into the position shown in Fig. 7. The leaf-spring 24 fastened to the under side of bar 65 holds latch 22 normally in non-engaging position, so that shield 17 is normally free to rock when the eye is pulled from its seat. If now a hook is about to be brought into engagement with an eye by the gripper in the manner above referred to, the upper side of the hook bill will strike latch 22 and throw it upward into the position shown in Fig. 7, thereby causing its hook 23 to engage loop 19 and to thus lock shield 17 over the eye, which has been delivered in the meantime to its seat in the manner described above. The hook 8 thus holding with its bill latch 22 in engaging position will on farther forward movement pull its hump past the eye without pulling the eye from its seat. The proportion and the location of latch 22 relatively to the size and the path of hook 8 are chosen so that when hump 9 has just passed the eye, the end of latch 22 resting upon the hook bill, will slide down the back of the hook and thus unlock shield 17 so that when the hook tends to pull the eye from its seat shield 17 will yield and let go the eye, which is now properly engaged by the hook as desired and ready to be carried to the cards as described in the patent above referred to. It will thus be seen that in this modification the hook itself forms the controlling element for the eye locking device, since the shield will remain locked so long as the hook is in the position in which it tends to pull its hump past the eye.

While I have described in the specification and shown in the drawings two par-

ticular forms of the device by which I obtain my purpose as an example and adapted to fit a particular form of eye feeding device, I do not wish to limit myself to these particular forms, since other forms which may vary according to the form and features of the eye feed may be employed to the same advantage without departing from the spirit of my invention.

What I claim is:

1. In a device of the character described, the combination with means for singly feeding eyes into engaging position, and means for singly feeding hooks to engage said eyes; of means for positively holding an eye in engaging position while engaged by a hook and releasing the hold on said eye only after it has been fully engaged.
2. In a device of the character described, the combination with means for singly feeding eyes into engaging position, and means for singly feeding hooks to engage said eyes; of automatic means for positively holding an eye in said engaging position while engaged by a hook and releasing the hold on said eye only after it has been fully engaged.
3. In a device of the character described, the combination with means for singly feeding eyes into engaging position, and means for singly feeding hooks to engage said eyes; of means controlled by said eye feeding means for positively holding an eye in said engaging position while engaged by a hook and releasing the hold on said eye only after it has been fully engaged.
4. In a device of the character described, the combination with means for singly feeding eyes comprising a supporting bar having a recess adapted to hold an eye, means for feeding eyes to said recess, a pusher in said recess adapted to push a single eye fed into said recess to the end of said bar into engaging position, means for operating said pusher, and means for singly feeding hooks to engage an eye fed into said position; of a shield suitably disposed on and pivoted to said bar to normally allow an eye to be pushed into and drawn by a hook from said engaging position and adapted to positively hold said eye in engaging position, said shield disposed to be locked in said eye holding position during the hook and eye engaging operation.
5. In a device of the character described, the combination with means for singly feeding eyes comprising a supporting bar having a recess adapted to hold an eye, means for feeding eyes to said recess, a pusher in said recess adapted to push a single eye fed into said recess to the end of said bar into engaging position, means for operating said pusher, and means for singly feeding hooks to engage an eye fed into said position; of a shield suitably disposed on and pivoted to said bar to normally allow an eye to be

pushed into and drawn by a hook from said engaging position and adapted to positively hold said eye in said position, said shield disposed to be automatically locked in said eye holding position during the hook and eye engaging operation.

6. In a device of the character described, the combination with means for singly feeding eyes into engaging position and means for singly feeding hooks to engage said eyes; of means controlled by the hook when in eye engaging position for positively holding an eye in said position while engaged by said hook and releasing the hold on said eye only after it has been fully engaged.

7. In a device of the character described, the combination with means for singly feeding eyes comprising a supporting bar having a recess adapted to hold an eye, means for feeding eyes to said recess, a pusher in said recess adapted to push a single eye fed into said recess to the end of said bar into engaging position, means for operating said pusher, and means for singly feeding hooks to engage an eye fed into said position; of a shield suitably disposed on and pivoted to said bar to normally allow an eye to be pushed into and thrown by a hook from said engaging position and adapted to positively hold said eye in said position, said shield disposed to be locked in said eye holding position by the hook during the engaging operation with said eye.

8. In a device of the character described, the combination with means for singly feeding eyes comprising a supporting bar having a recess adapted to hold an eye, means for feeding eyes to said recess, a pusher in said recess adapted to push a single eye fed into said recess to the end of said bar into engaging position, means for operating said pusher, and means for singly feeding hooks to engage an eye fed into said position; of a shield suitably disposed on and pivoted to said bar to normally allow an eye to be pushed into and drawn by a hook from said engaging position and adapted to positively hold said eye in said position, and means adapted to cooperate with and to be controlled by said hook when in eye engaging position for locking said shield in said eye holding position.

9. In a device of the character described, the combination with means for singly feeding eyes comprising a supporting bar having a recess adapted to hold an eye, means for feeding eyes to said recess, a pusher in said recess adapted to push a single eye fed into said recess to the end of said bar into engaging position, means for operating said

pusher, and means for singly feeding hooks to engage an eye fed into said position; of a shield suitably shaped and pivoted to said bar to normally yieldingly cover said recess near the end of said bar to allow an eye fed by said pusher to slide to the end of said recess underneath said shield and to be pulled by a hook from said recess, and means adapted to cooperate with and to be controlled by said hook when in eye engaging position for locking said shield in said eye holding position.

10. In a device of the character described, the combination with means for singly feeding eyes comprising a supporting bar having a recess adapted to hold an eye, means for feeding eyes to said recess, a pusher in said recess adapted to push a single eye fed into said recess to the end of said bar into engaging position, means for operating said pusher, and means for singly feeding hooks to engage an eye fed into said position; of a shield suitably shaped and pivoted to said bar to normally yieldingly cover said recess near the end of said bar to allow an eye fed by said pusher to slide to the end of said recess underneath said shield and to be pulled by a hook from said recess, a loop suitably fastened to said shield, a latch pivoted to said bar adapted to engage said loop and lock said shield over said eye, said latch disposed in the path of said hook to normally remain in loop disengaging position, said hook when moving into eye engaging position causing said latch to engage said loop and when moving out of eye engaging position causing said latch to disengage its loop.

11. In a device of the character described, the combination with means for singly feeding eyes into engaging position and means for singly feeding hooks to engage said eyes; of means controlled by the hook while in transit for positively holding an eye in said position while engaged by said hook and releasing the hold on said eye only after it has been fully engaged.

12. In a device of the character described, the combination with means for singly feeding eyes into engaging position and means for singly feeding hooks to engage said eyes; of automatic means controlled by the hook while in transit for positively holding an eye in said engaging position while engaged by a hook and releasing the hold on said eye only after it has been fully engaged.

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Witnesses:

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WM. E. KNIGHT.