H. BIRNBAUM.

ATTACHMENT FOR KNITTING MACHINES.

APPLICATION FILED JULY 5, 1910.

1,007,264.

Patented Oct. 31, 1911.

3 SHEETS—SHEET 1.

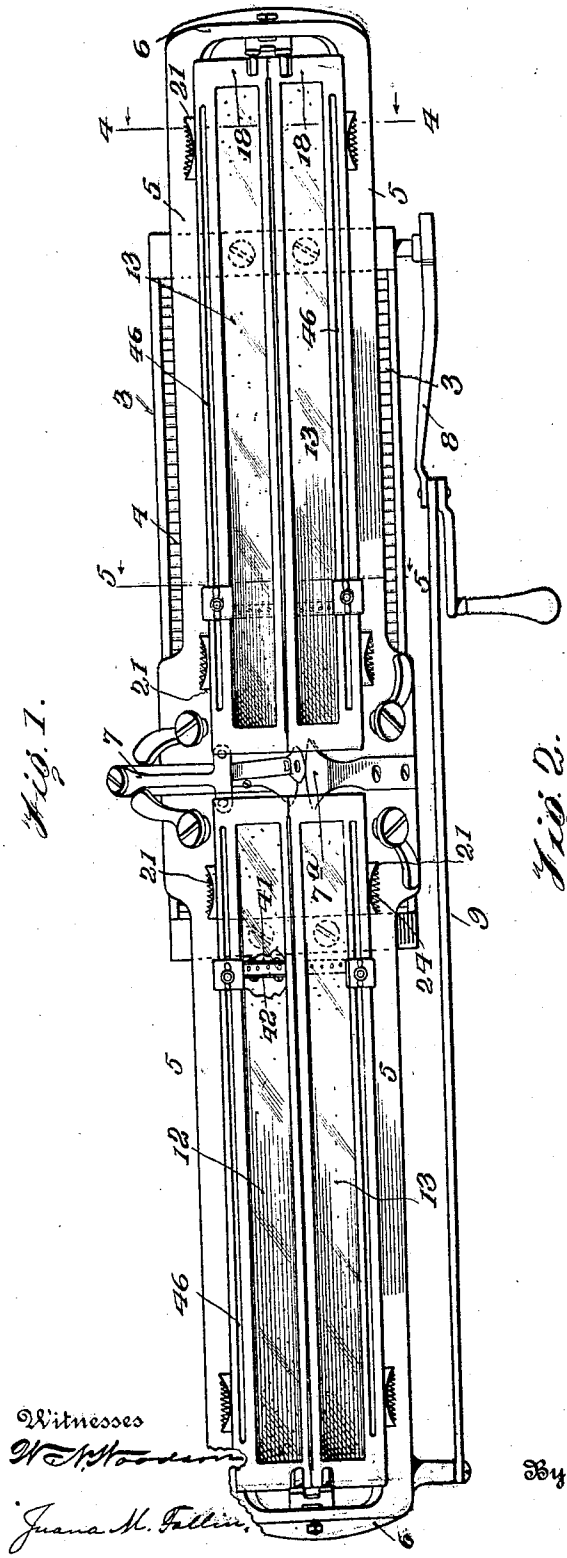

Fig. 1.

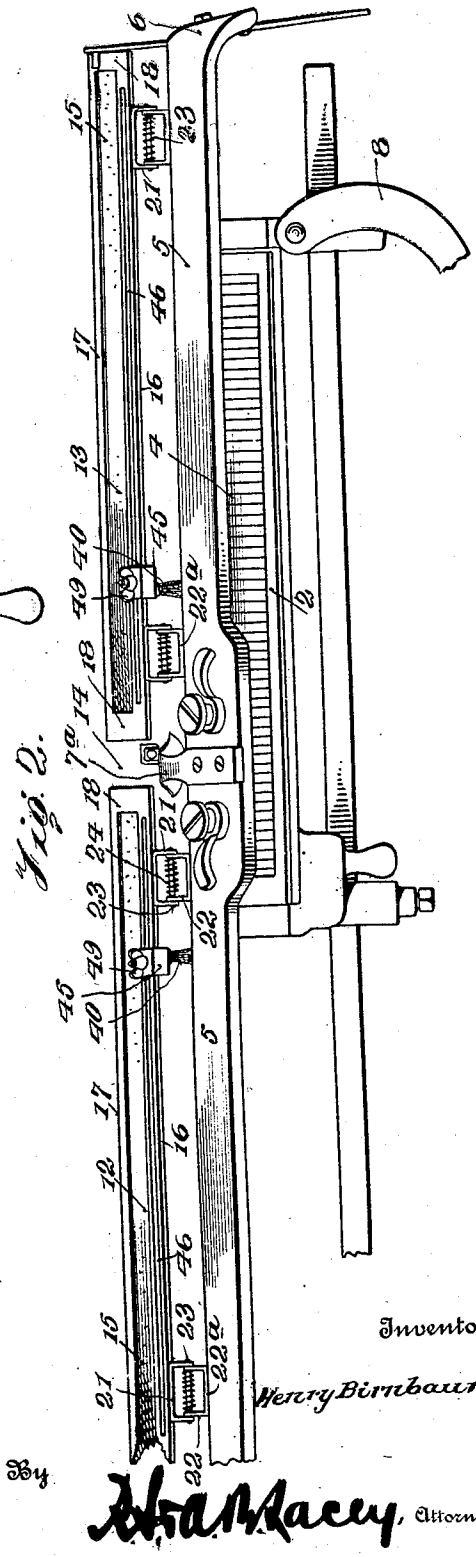

Fig. 2.

Witnesses

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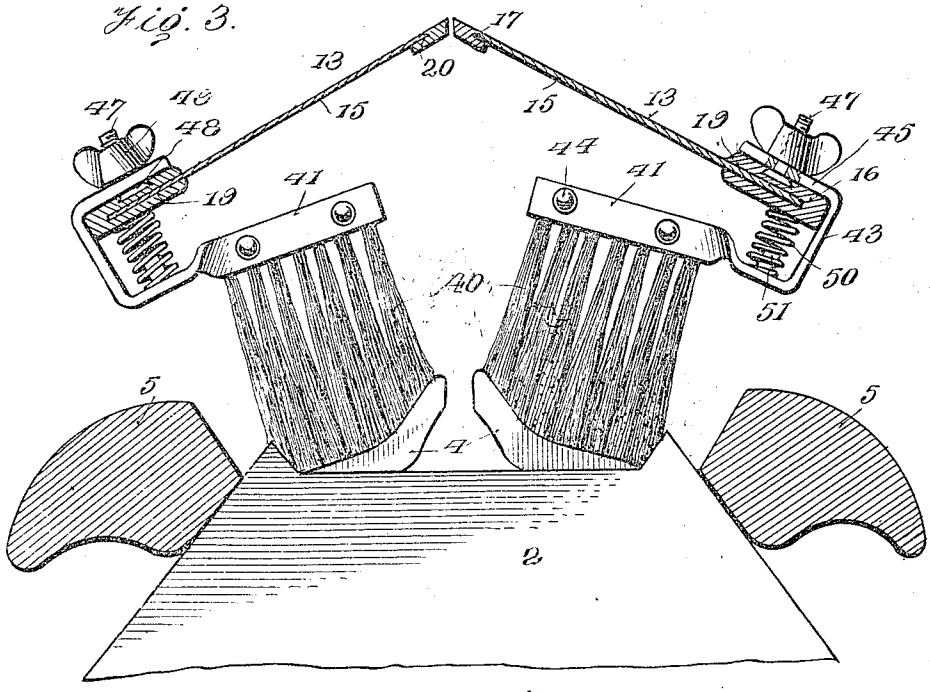
3 SHEETS—SHEET 2.

Fig. 3.



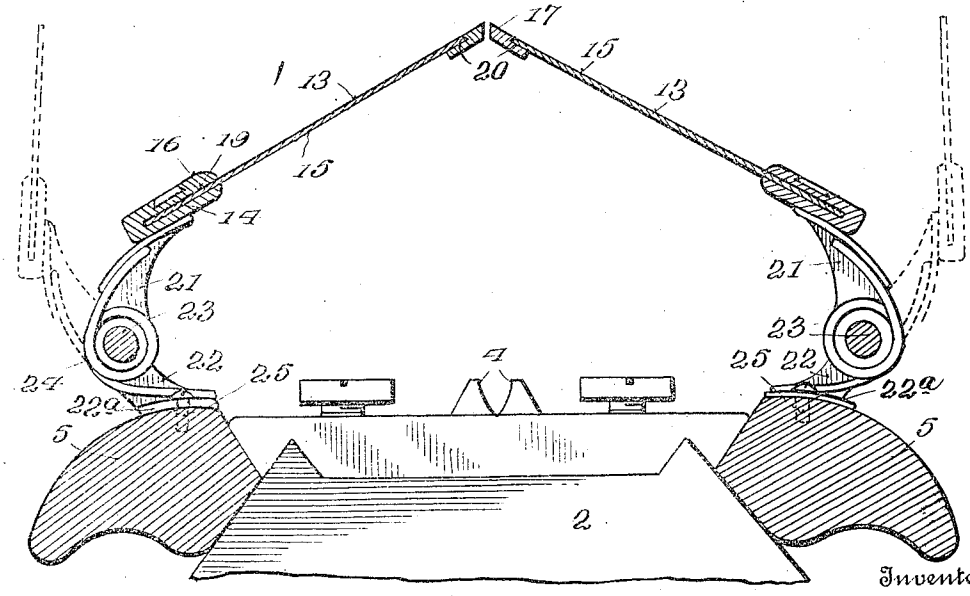


Fig. 4.

Witnesses

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3 SHEETS—SHEET 3.

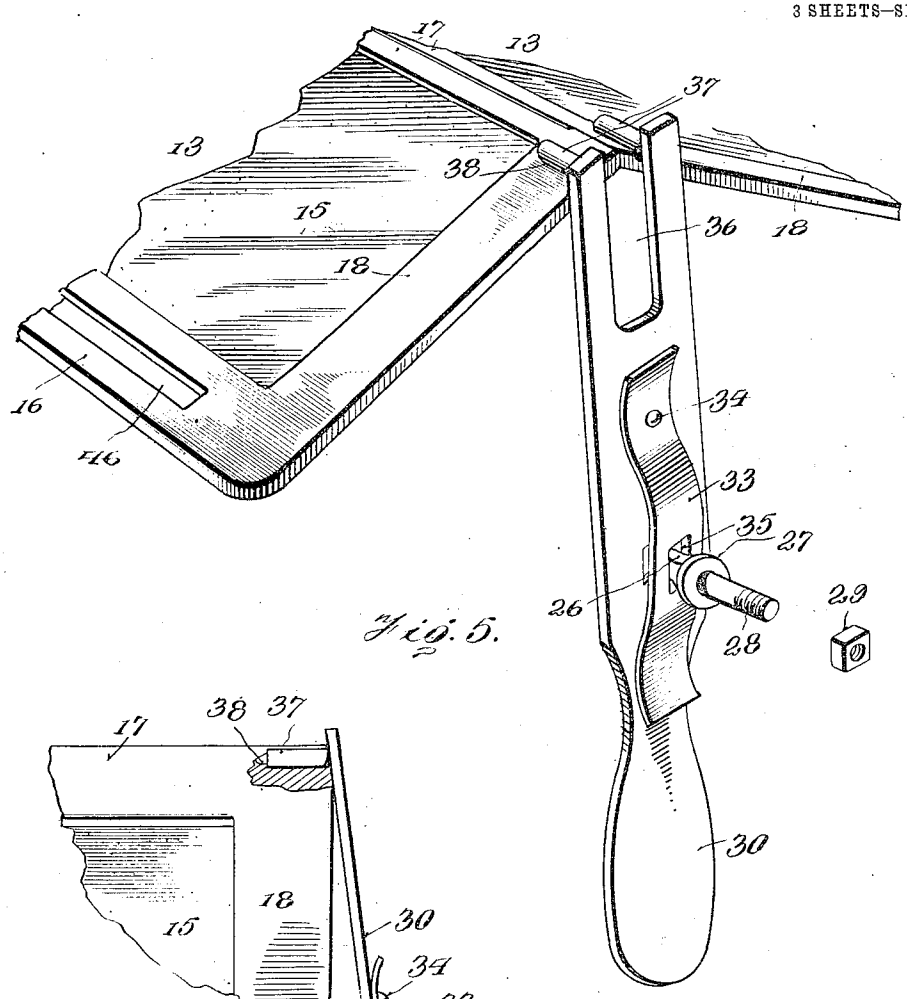

Fig. 5.

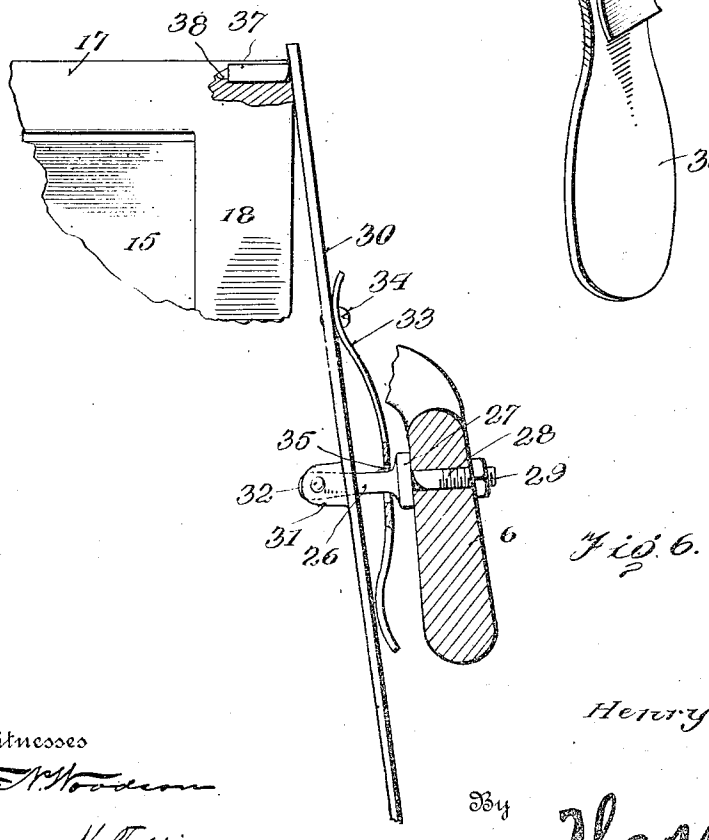

Fig. 6.

Witnesses

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UNITED STATES PATENT OFFICE.

HENRY BIRNBAUM, OF NEW YORK, N. Y.

ATTACHMENT FOR KNITTING-MACHINES.

1,007,264. Specification of Letters Patent. **Patented Oct. 31, 1911.**

Application filed July 5, 1910. Serial No. 570,525.

To all whom it may concern:

Be it known that I, HENRY BIRNBAUM, subject of the Emperor of Austria-Hungary, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Attachments for Knitting-Machines, of which the following is a specification.

My invention relates to knitting machines or similar mechanisms, and particularly to an attachment therefor mounted upon the carriage of the knitting machine and constituting a cover or casing for the banks of the needles, and carrying brushes contacting with the upper faces of the needle plates.

The object of my invention is twofold.

One object is to entirely cover in and protect the needle plates and the upper portions of the needles from dust and dirt, and to prevent fluff or lint from being blown off of the needle bed and disseminated in the air, and also to prevent fluff or lint from other machines from falling on to the needle beds in use; and the other object is to brush this fluff or lint off of the needle plates at each reciprocation of the carriage so that the fluff shall not accumulate in the spaces between the needle plates and obstruct the operation of the needles and overlie and obscure the needles so that broken or defective needles can not be observed, a very common occurrence in the operation of knitting machines, and one which causes defective goods to be turned out.

A relatively minor object is to provide a cover or casing which is provided with transparent panels whereby the operation of the machine may be observed, and which is composed of sections capable of being opened to permit an adjustment or repair of any part, or the proper manipulation of the threads or yarn, and which is normally held closed by a latching device.

The invention comprehends in its general features a two-part, sectional cover formed of pairs of shields mounted upon and movable with the usual carriage of such length as to cover in or extend over the needle banks in any position of the carriage, each half section of the cover being supported on springs which tend to open the cover sections, the sections being held closed by latching devices at both ends of the carriage, which when manipulated permit the cover sections to fly open. Each section of this cover is provided with a brush disposed at the inner end of the section and extending downwardly into contact with the needle banks and acting upon a reciprocation of the carriage to brush the lint etc. toward the ends of the machine.

While I do not wish to be limited to the use of my device with any particular form of machine, I have in the accompanying drawings shown my invention applied to a straight-knitting machine such as is used in knitting cardigan or jersey cloths.

In said drawings:—Figure 1 is a top plan view of so much of a straight-knitting machine as is necessary to illustrate my invention and showing my invention as applied thereto, the knitting machine being shown conventionally. Fig. 2 is a side elevation of the parts shown in Fig. 1. Fig. 3 is an enlarged detail section about full size on the line 3—3 of Fig. 1. Fig. 4 is a transverse detail section on the same scale as Fig. 3 and taken on the line 4—4 of Fig. 1. Fig. 5 is a fragmentary perspective view of one end of the cover and the latching device. Fig. 6 is a side elevation partly in section of the parts shown in Fig. 5.

Referring now particularly to Figs. 1 and 2, 2 designates the bed of a straight-knitting machine of any usual type having the usual oppositely disposed, upwardly inclined needles, and the oppositely disposed, upwardly and inwardly inclined banks of needle plates 4 between which the needles operate, the row of needle plates on one side of the machine and the needles therebetween being spaced from the row of needles and needle plates on the other side of the machine to permit the passage of the knitted fabric between the banks of needles and needle plates. 5 designates the oppositely disposed, longitudinally extended side bars of the usual reciprocating carriage, the bars being connected at their ends by integral portions 6 which are curved downward below the plane of the carriage. The thread guide 7 is mounted on the carriage midway be-

tween the ends thereof and reciprocates with it. The carriage is operated by a crank 8 connected by a link 9 to the end of the carriage as at 10. All these parts are as usually constructed and involve no change from the standard types of knitting machines.

My attachment includes two pairs of covers or shields 12—12, 13—13, each pair of cover sections being of a length somewhat less than half the length of the carriage. The cover sections are hingedly supported upon the side bars of the carriage as shown in Fig. 4 and are disposed in an upwardly and inwardly inclined position so as to nearly meet above the middle plane of the machine, thus leaving a relatively large space between the inside faces of the cover sections and the needle plates and needles. The edges of the cover sections of each pair nearly abut against each other when the shields are closed, as shown in Figs. 3 and 4. The pairs of cover sections are spaced from each other at 14 (see Fig. 2) a distance sufficient to permit the operation of the usual yarn guide 7 and brush 7a. The carriage is more than twice the length of the banks of needles, and each pair of cover sections is therefore about equal in length to the bank of needles.

Preferably, each cover section is formed with a panel of transparent material such as celluloid or isinglass designated 15 in the drawing and supported in any suitable manner in a metal frame and composed of longitudinal, parallel bars 16 and 17 and end portions 18. These bars may be integral or not as desired. Preferably, one of the side bars as for instance the bar 16, is longitudinally slitted as at 19 for the reception of one margin of the transparent panel 15, while the other bar 17 is rabbeted as at 20, the wall of the rabbet being undercut. This construction permits one margin of the strip 15 to be inserted in the slit 19 and the other margin to be sprung into place. I, of course, do not limit myself to this feature.

The bar 16 of each cover section is attached at or near its ends to hinge members 21 pivoted to ears or brackets 22 by a pintle 23. A spring 24 surrounds this pintle, one end of the coil of the spring bearing against the under face of the hinged member 21, and the other end of the coil against the upper face of the base supporting the ears 22. The tension of the spring is thus exerted to raise the cover sections upward, that is, into the position shown in dotted lines in Fig. 4. The base portion 22a of the ears 22 are held to the bars of the carriage by means of screws 25, or in any suitable manner. The adjacent edges of the bars of each pair of cover sections along their greater extent do not quite meet each other and thus when the cover sections are closed, as in the positions shown in Figs. 3 and 4, the edges of the bar 17 will not quite contact but a space is left between them about one-sixteenth of an inch in width. The space permits the entrance of yarn from other spools entering into the needle beds, and designed to be woven with the yarn from the main spool. Though this space is left, the space is so slight as not to permit dust or dirt to enter between the bars or to escape from below the covers.

While I have described a specific construction of the cover sections, I wish it understood that I do not limit myself to the specific form shown, as the frame forming the cover sections may be modified in many ways, as may the means for attaching the cover sections to the carriage.

The springs 24 act as before stated to hold the cover sections open, and in order to hold the cover sections closed and in the position shown in Figs. 3 and 4, I provide at each end of the machine a latching device such as is shown in detail in Figs. 5 and 6. This latching device is preferably mounted upon the depressed end portions 6 of the carriage and consists generally speaking in a spring pressed latching bar having detents which engage over the ends of the cover sections and hold them down, the latching bar being adapted to be pressed so as to disengage its detent from the cover sections to permit the springs to open the cover sections.

In detail the construction is as follows: Mounted upon the end portions 6 of the carriage is a post 26 which is provided at one end with a shoulder 27, and with a reduced screw threaded portion forming a bolt and designated 28 which passes through the end of the carriage 6 and is provided with a nut 29, whereby the post may be clamped upon the carriage. The inner end of the post 26 is flattened and passes through a slit formed in a latch bar 30. This latch bar is provided on its inside face on opposite sides of the slot with the ears 31, and a pivot pin 32 passes through said ears and through the flattened extremity of the post 26. Thus the latch bar is pivotally mounted upon the post. Disposed upon the outer face of the latch bar 30 is the bowed spring 33 which is attached at one end to the latch bar by a screw 34, and which is slotted as at 35 to permit the flattened end of the post to pass through, the free end of the spring beyond this slot being curved toward the latch bar and contacting therewith, the spring bearing against the shoulder 27. The upper end of the latch bar is bifurcated as at 36, and the two arms so formed are provided at their upper extremities with the inwardly projecting detents 37. These are adapted to be received in recesses 38 formed in the ends

of the cover section frames near the inner edges thereof, these recesses being preferably formed in the relatively wide end portions of the frames. It will now be seen that by pressing inward on the lower end of the latch bar 30 that the upper end of the latch bar will be moved away from the cover section and against the force of the spring 33. As soon as the detents 37 have released their engagement with the cover sections, the springs 24 will act to throw the cover sections open. It will be obvious that one of the cover sections may be held by hand at the same time pressing upon the latch bar 30 as above described, and thus that only the other cover section may be released. While I have found that this form of latching device is very convenient in operation, and very simple in construction, I do not wish to limit myself to this as it is obvious that other latching devices might be provided acting practically in the same manner without departing from the spirit of the invention.

A considerable source of trouble in knitting machines is due to the fact that lint and fluff become deposited upon the upper edges or faces of the needle plates and fills the spaces between these plates so as to hide the needles between the plates and prevent the operator observing whether these needles are broken or unbroken. As a consequence, oftentimes the operator does not notice that any particular needle is defective, and it is only after many rows of stitching have been made that the defect will be noted by the defect in the fabric turned out. In order to avoid this, I have provided oppositely disposed pairs of brushes, one brush for each of the cover sections, so mounted upon the cover sections as to reciprocate with the cover sections and with the carriage, the bristles of these brushes extending down into contact with the upper faces of the needle plates and cleaning the same of fluff and lint at each reciprocation of the carriage. This construction is shown particularly clearly in Fig. 3. The bristles 40 of each brush are supported in bristle clamps 41 consisting of two opposed plates 41 and 42, the plate 41 forming part of a supporting bracket 43, the plate 42 being clamped against the plate 41 by means of bolts and nuts 44. The bracket 43 extends outward, then upward to a point above the side bar 16 of the cover section frame, and then extends toward the free edge of the adjacent cover section, as at 45. Any suitable means may be used for attaching the brackets 45 to the frame bar 16, and the brackets may be attached permanently to the frame bars if desired. Preferably, however, in order to provide for cases in which relatively narrow goods are being woven, and where the reciprocation of the frame is therefore less than the full amount and so requires an adjustment of the brushes, I mount the brackets 43 adjustably upon the bars 16. One manner of doing this which I have found to be effective in practice is to form the upper face of the frame bar 16 with a longitudinally extending groove 46 having undercut side edges. A bolt 47 passes through the upwardly extending terminal end 45 of the bracket 43, and this bolt is provided with a head 48 at its end having beveled side edges adapted to engage beneath the undercut edges of the groove 46. This head is thereby adapted to slide longitudinally along the groove and to be held in any adjusted position by a wing nut 49 engaging with the bolt 47.

It is preferable that the brushes 40 shall be resiliently forced down into contact with the needle plates 4, and to this end I make the bracket 43 slightly yielding and interpose between the upper face of each bracket and the adjacent portions of the frame, the coil spring 50, this spring being held in place by any suitable means as by the upwardly projecting stud 51. It will be seen from Figs. 1 and 2 that the groove 46 is of such length that the brushes may be disposed at any point desired upon the carriage. Preferably, and under normal circumstances where goods of full width are being knitted, the brushes are mounted at the inner ends of the cover sections. There will thus be a pair of brushes located on each side of the yarn-guiding devices. By this means I secure a brushing action over the whole extent of the banks of needle plates, which would not be the case if only one pair of brushes were used. Thus upon a movement of the carriage in one direction, one pair of brushes will move beyond the needle plates when the carriage has reached the full length of its travel, while the other pair of brushes will be in contact with the needle plates, while upon a movement of the carriage in the other direction, the last named pair of brushes will move over the whole face of the carriage and be carried beyond the same, and the last pair will only be carried along a portion of the length of the needle bed. Upon each reciprocation of the carriage, therefore, the brushes will act to carry the fluff and lint from one end of the carriage to the other, brushing it off of the upper faces of the needle plates and clearing the spaces therebetween and carrying the fluff and lint to the closed end of the needle bed from which it may afterward be removed in any desired manner. It will, of course, be noted that when the cover sections are raised to the position shown in

dotted lines in Fig. 4 that the brushes will also be raised clear of the needle plates. The brushes will thus not obstruct any manipulation of the needles which may be necessary.

It will be seen that my invention is very simple and yet effective in operation, and that it may be separately manufactured and attached to any standard form of knitting machine, while it may be easily modified to suit any special type of knitting machine. It has been found particularly good in practice in that it tends to prevent any fouling of the yarn, keeps the fluff and lint from being carried into the air of the room and thus into the lungs of the operators, and keeps the needle plates of the machines in such condition that the operator may at all times observe the action of the needles and note that the machine is properly working.

What I claim is:

1. The combination with a knitting machine having a bank of needles and needle plates, and a movable carriage, of a cover formed in two laterally disposed sections, each section being hingedly mounted on the side of the carriage, and said sections extending over the needle plates and toward each other, springs acting to raise the cover sections to permit the needles to be manipulated, and means for latching the cover sections in a closed position.

2. The combination with a knitting machine having a bank of needles and needle plates, and a movable carriage including oppositely disposed side members, of a cover formed of two sections, each section being independently hinged to the side members of the carriage, said cover sections extending over the needle plates and toward each other, and each section being provided with a transparent panel whereby the needles may be observed, and means for latching the cover sections in a closed position.

3. The combination with a knitting machine having a bank of needles and needle plates, and a movable carriage, said carriage being approximately of a length about twice the length of the bank of needles and being provided midway its length with thread guiding devices, of a cover composed of two pairs of cover sections, the pairs of sections being mounted upon opposite portions of the carriage on each side of the thread guiding devices, the sections of each pair being hinged to the adjacent portions of the carriage and extending upward and over the needle plates, the said cover sections being provided each with a transparent panel.

4. The combination with a knitting machine having a bank of needles and needle plates, and a movable carriage including longitudinally extending side bars, said carriage having a length approximately equal to twice the length of the bank of needles, and thread guiding devices mounted at the middle of the carriage, of a pair of cover sections disposed on each side of the thread guiding devices, each pair consisting of oppositely disposed cover sections hinged to the side bars of the carriage and extending upward and inward toward each other, each cover section being provided with a transparent panel, independent springs acting to force each of said cover sections open, and latching devices acting to hold the cover sections closed.

5. The combination of a knitting machine having a bank of needles and needle plates, a movable carriage and thread-guiding devices mounted upon the movable carriage midway the ends thereof, of oppositely disposed pairs of cover sections located on each side of the thread-guiding devices, the sections of each pair being hinged to the side bars of the carriage and extending upward and toward each other, transparent panels located in the cover sections, springs acting to force the sections of each pair of cover sections open, and latching devices located at opposite ends of the carriage, each consisting of a latching bar having detents engaging with the ends of the adjacent cover sections.

6. The combination with a knitting machine having a row of needles and needle plates and a movable carriage mounted in connection therewith, of a cover section hingedly mounted upon the said carriage and extending over the row of needles and needle plates, and a brush mounted upon the cover section and depending into contact with the upper face of the needle plates, said brush being movable with the cover section away from the needle plates when the cover section is opened.

7. The combination with a knitting machine having oppositely disposed rows of needles and needle plates, and a movable carriage mounted in connection therewith, of oppositely disposed cover sections hingedly mounted upon the said carriage and extending over the rows of needles, and brushes mounted upon the cover sections and depending into contact with the upper faces of the needle plates, said brushes being longitudinally adjustable.

8. The combination with a knitting machine having oppositely disposed rows of needles and needle plates, and a movable carriage mounted in connection therewith, and having longitudinally extending side bars, of oppositely disposed pairs of brushes supported on the side bars and hingedly mounted so as to be raised out of or turned down into contact with the needle plates,

said brushes having bristles extending downward into contact with the upper faces of the needle plates.

9. The combination with a knitting machine having oppositely disposed rows of needles and needle plates and a movable carriage operatively mounted in connection therewith, of oppositely disposed cover sections hingedly mounted upon said carriage and adapted to extend over the rows of needles, and brushes mounted upon said cover sections and depending into contact with the upper faces of the needle plates.

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

HENRY BIRNBAUM. [L. S.]

Witnesses:
HENRY S. SCHIMMEL,
EMIL G. HAAS.