Sept. 13, 1949. E. VOSSEN 2,481,632

RETRACTABLE ELECTRIC NEEDLE PROTECTOR FOR KNITTING MACHINES

Filed Oct. 22, 1948

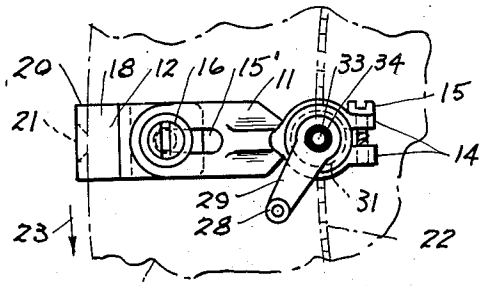


Fig. 1

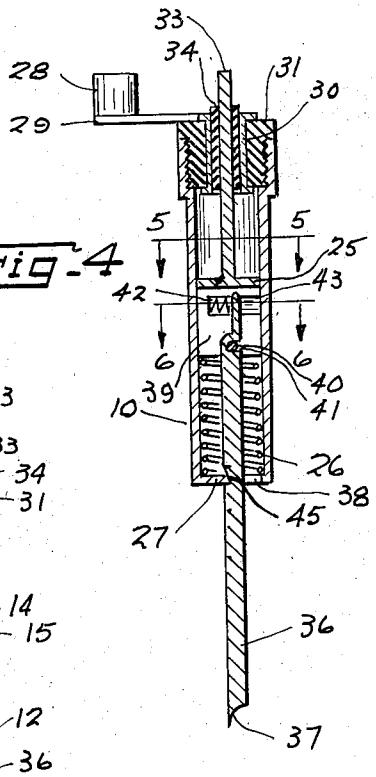


Fig. 4

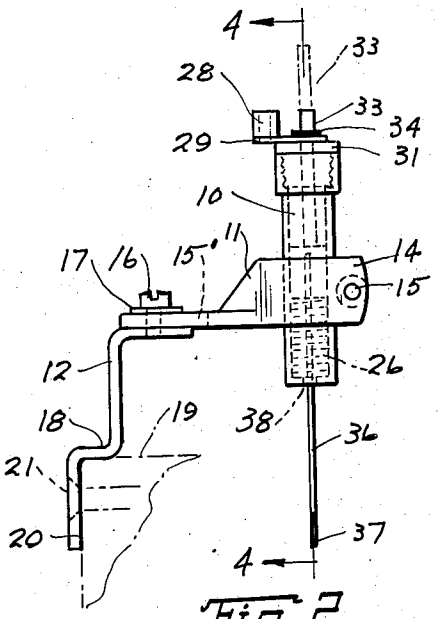


Fig. 2

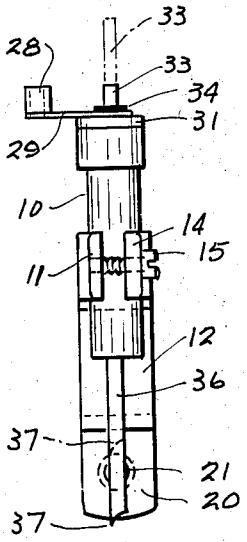


Fig. 3

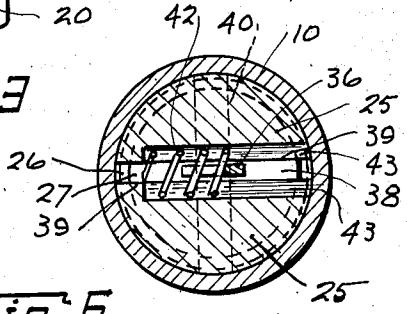


Fig. 6

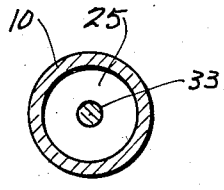


Fig. 5

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RETRACTABLE ELECTRIC NEEDLE PROTECTOR FOR KNITTING MACHINES

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Application October 22, 1948, Serial No. 55,848

11 Claims. (Cl. 66—157)

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This invention relates to new and useful improvements in electric needle protectors for knitting machines having electric stop motion devices.

More particularly, the invention relates to electric needle protectors which have pointers adapted to be placed in positions around the cylinders of the machines where the dial needles are recessed or retracted to a maximum so that the stitches are completed. In these particular areas there is little room, and for this reason prior needle protectors were constructed with their pointers adapted to swing in arcs away from this area when they are set "off." In this way room is provided for the operator to rethread the needles when necessary.

For maximum efficiency it is required that the pointer of a needle protector be placed as close as possible to the finished stitches being knitted by the knitting machine. This invention particularly proposes improvements upon prior needle protectors which make it possible in a practical way to properly set the pointer close to the finished stitches, and to maintain this setting indefinitely. With the old protectors they were generally correctly "set" when installed. However, after some use the operators usually inadvertently forced them out of adjustment. This is due to the fact that it is necessary to manually grip the pointers of the old needle protectors and push them back to their operative positions after they have been set off. Frequently, inexperienced operators, or careless persons, would push the pointers back to their starting positions with too much force and consequently bend them very slightly. After this is done several times they are out of adjustment. The entire knitting machine is then in danger. As the lumps and fuzz from the threads and yarns accumulate on the needles of the knitting machine there is a tendency for the needles to break. It is the function of the needle protectors to operate the stop motion of the knitting machine when these lumps exceed certain permissible sizes. If the knitting machine is not stopped timely the lumps increase until some of the knitting needles either become damaged or actually break. If the machine continues operating additional needles, some times hundreds, or even all of the needles, may become involved and break. Moreover, when even but one needle breaks the knitted material is knitted with a hole.

A very important feature of the new needle protector, in accordance with this invention, resides in an arrangement whereby the pointer is

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moved back to its operative or forward position close to the knitting needles without directly touching or moving the pointer. It is proposed that a certain stem be provided which when moved, indirectly moves the pointer back into the said operative, or forward position. For this reason it is impossible for the pointer to be accidentally manually flexed and bent when resetting the protector.

Another object of this invention resides in so arranging the stem by which the pointer is reset that it is easy to see whether or not the needle protector is in an "on" or "off" position. With this visible indicator, the operator may easily pick out which needle protector stopped the knitting machine, or whether some other stop motion device on the knitting machine caused the stoppage.

As previously stated there is very little room at the point where the pointer of the needle protector is placed close to the recessed or retracted needles of the knitting machine completing the stitches. Prior needle protectors were constructed so that their pointers swung in arcs away from this area to permit access for rethreading or replacing the needles. However, in many machines the room is so limited that the pointers necessarily are very restricted in the amount they can swing, with the result that they are in the way and inconvenience the operator in his work. An important object of this invention resides in so constructing the new needle protector that when it is set off the pointer swings but a very small distance and then moves a great distance in a longitudinal direction into a retracted position. The advantages of this operation are readily apparent. Because of the small arcuate swing of the pointer, the needle protector may be used in places where there is very little space. Then, because it moves longitudinally into a retracted position it moves away from the cramped quarters so that this area is readily accessible to the operator.

Another object of the invention is the construction of a device as described which is simple and durable and which may be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawing, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawing forming a material part of this disclosure:

Fig. 1 is a plan view of a retractable electric needle protector for a knitting machine, constructed in accordance with this invention, and illustrated schematically applied to a portion of a knitting machine shown in dot and dash lines.

Fig. 2 is a front elevational view of Fig. 1.

Fig. 3 is a side view of Fig. 2.

Fig. 4 is an enlarged vertical sectional view taken on the line 4—4 of Fig. 2, but illustrated with the support brackets removed.

Fig. 5 is an enlarged horizontal sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is an enlarged horizontal sectional view taken on the line 6—6 of Fig. 4, this view being drawn on a larger scale than used on Fig. 5 to better illustrate certain small parts.

The retractable electric needle protector for a knitting machine having an electric stop motion, in accordance with this invention, includes a member 10 for attachment upon a part of the knitting machine so that said member 10 moves relative to and along the knitting needles of the machine. The member 10 is in the nature of a tubular member. It is supported by brackets 11 and 12. The bracket 11 has a clamp portion 14 formed at one end and controlled by a screw 15 by which the member 10 may be clamped in various raised and lowered positions, and also in various turned positions. The other end of the bracket 11 is formed with a slot 15' through which a support screw 16 passes. A washer 17 is placed under the head of the support screw 16. The support screw 16 threadedly connects with the bracket 12 and maintains the bracket 11 in a horizontal position upon the top end of the bracket 12. The bracket 12 is provided with an offset portion 18 for resting upon the dial cap or other part of a knitting machine. In Figs. 1 and 2 the dial cap is schematically indicated by reference numeral 19. The bracket 12 also has a bottom portion 20 with an opening 21 for a fastening screw by which it may be attached on said dial cap 19. In Fig. 1 the arcuate lines 22 schematically indicate a small group of vertical knitting needles of a knitting machine. The arrow 23 indicates the direction of relative movement of the dial 19 to the needles 22. From this it may be understood that the member 10 will move relative to and along the knitting needles of the knitting machine.

A plunger 25 is movably mounted relative to said member 10, to move from a forward or down position to a retracted or up position, and back to the forward position again. More particularly, the plunger 25 is slidably mounted like a piston within the tubular member 10 and may slide from a forward (down) position in the tubular member 10 to a retracted (up) position therein. The needle protector does not necessarily have to be mounted in a vertical position on a knitting machine. It may be mounted horizontally or at an angle. When it is mounted vertically the tubular member 10 is vertical and the retracted position of the plunger 25 is up, while the forward position is down.

Resilient means urges the plunger 25 into its retracted position. This resilient means is in the nature of an expansion spring 26 housed within the tubular member 10 and acting between the bottom 27 of the tubular member 10 and the bottom end of the plunger 25.

An electric circuit is associated with the plunger 25. Said electric circuit is intended to be connected with the electric stop motion of the knitting machine. Said electric circuit includes

a circuit opener and a circuit closer synchronized with said plunger 25 for closing the circuit when the plunger 25 is retracted. Said electric circuit includes a terminal 28 for connection with the circuit of the electric stop motion of the knitting machine. This terminal 28 is mounted upon an arm 29 which connects with a tubular member 30 mounted through a cap 31 threadedly engaged on the top of the tubular member 10. The cap 31 is of insulation material. The plunger 25 is provided with a top stem 33 which extends through the tubular member 30. An insulation tube 34 is engaged through the tube 30 and about the stem 33 so as to insulate the stem 33 from the tubular member 30. The above mentioned electric circuit may be traced from the terminal 28 through the arm 29 to the bottom end of the tube 30. When the plunger 25 moves to its retracted position, that is, to its extreme top position, it will engage the bottom of the tube 30 and then the circuit is closed to the plunger 25, the tubular member 10, the brackets 11 and 12, and so to the ground of the knitting machine. The plunger 25 cooperating with the bottom of the tube 30 comprises the circuit opener and closer previously referred to, which is synchronized with the plunger 25 for closing the circuit when the plunger 25 is in its fully retracted position, and for opening the circuit when the plunger 25 moves forward.

A pointer 36 is connected with the plunger 25, and is provided with a pointed bottom end 37 for location as close as possible to the finished stitches being knitted by the knitting machine, when said plunger 25 is in its forward position. This pointer 36 is retractable by the plunger 25 in order to be spaced a relative large distance from said stitches when the plunger 25 is retracted. The pointer 36 passes through a slot 38 formed in the bottom 27 of the tubular member 10. This slot 38 is slightly wider than the thickness of the pointer 36 in order to guide the pointer 36 in its movements. The plunger 25 is formed with a slit 39 slightly wider than the thickness of said pointer 36 into which the top end of the pointer 36 engages. A pintle pin 40 is mounted through the bottom portion of the plunger 25 across the slit 39. The pointer 36 has a side notch 41 which is hooked on to the pintle pin 40. A horizontal spring 42 is housed in a horizontal opening 43 formed in the top portion of the plunger 25 between the adjacent faces of the slit 39. The top end of the pointer 36 engages and normally compresses said spring 42. The spring 42 acts as a resilient means for pivoting and urging the bottom of said pointer 36 slightly lateral to a normal position in order that a lump or lumps of foreign material forming at the needles of the knitting machine may move said pointer 36 out of said normal position.

Latch means is associated with said pointer 36 and operates between said member 10 and said pointed 36 for holding said pointer forwards when said pointer is in its said lateral normal position. Said latch means includes keeper elements formed on said member 10 and in the pointer 36. These keeper elements comprise a notch 45 formed in the side of the pointer 36 and engageable with one end of the slot 38 in the bottom 27. Said keeper elements 45 and the end of the slot 38 are adapted to disengage, when said pointer 36 is moved laterally out of said normal position in order that the spring 26 may retract the plunger 25 and so indirectly retract the pointer 36.

The use and operation of the new needle protector may be understood from the following:

On the drawing, the needle protector is illustrated in its loaded condition, that is, a condition in which the pointer **36** is in its forward position. It is held in this position by the springs **26** and **42**. The spring **26** acts to urge the plunger **25** upwards, but since the top end of the pointer **36** is hooked on to the pintle pin **40**, the pointer **36** is being urged upwards. It is held down by the keeper element **45**, that is the notch **45**, engaging the end of the slot **38**. The spring **42** acts against the top end of the pointer **36** to pivot the pointer **36** slightly laterally about the pintle **40** as a pivot, and in this way urges and holds the notch **45** against the end of the slot **38**.

A live wire from the electric stop motion system of the knitting machine is engaged on the terminal **28**. No current flows because the terminal **28** connects with the tube **30** which is insulated by the tube **34** and the cap **31**. The electric needle protector is mounted on the knitting machine and suitably adjusted so that the point **37** of the pointer **36** is as close as possible to the stitches being formed and finished by the knitting machine. Several needle protectors may be used on a knitting machine. A suitable arrangement would be to have one needle protector for each four feeds of the knitting machine. The screw **16** may be loosened so that the bracket **11** may be shifted horizontally inwards and outwards. The screw **15** may be loosened so that the member **10** may be turned and may also be raised and lowered as required. Each electric needle protector is positioned at the point where the dial knitting needles are recessed to their maximum extent, at which instant the loops of the stitches are just pulled tight and completed.

During the operation of the knitting machine the point **37** moves relative to the knitting needles. However, the recessed area of the knitting needles moves along with the pointer **36**. As foreign material collects on the knitting needles an obstruction will soon be formed which will engage the point **37**. The needle protector is so mounted in relation to its motion relative to the knitting needles that said lump causes the bottom end of the pointer **36** to pivot slightly towards the right in relation to Fig. 4. This disengages the notch **45** from the left hand end of the slot **38**. Immediately the spring **26** urges the plunger **25** upwards into its retracted position. In this latter position the plunger **25** will engage the bottom end of the tube **30** closing the electric circuit from the tube **30** to the plunger **25** and thus to the ground of the stop motion system of the knitting machine, causing the stop motion to function to stop the knitting machine.

When the plunger **25** moves upwards to its retracted position, the stem **33** correspondingly moves upwards, as indicated by the dot and dash lines in Figs. 2 and 3. In Fig. 3 particularly note the dot and dash position of the point **37** which represents the raised or retracted position of the pointer **36**. The operator may easily spy the raised stem **33** and so immediately note that the knitting machine was stopped by the particular needle protector. If desired, the stem **33** may be colored red so as to be more prominent. The operator then corrects the defect which caused operation of the needle protector. Because the pointer **36** was raised there is ample room to reach the needles so as to conveniently engage the loops back on them. When all the necessary adjustments have been made, the needle protector is reset merely by depressing the stem **33** to its original position. When the stem **33** is moved downwards the plunger **25** will be correspondingly moved. This indirectly moves the pointer **36** downwards. When the pointer **36** reaches its extreme downward position the notch **45** will re-engage the end of the slot **38** because of the pivoting action of the spring **42**. The needle protector is now reset in operative position again.

It should be particularly noted that the pointer **36** is required to swing through but a very small arc during the operation of the needle protector. The arc is sufficient to merely disengage the notch **45** from the end of the slot **38**. Thereafter the pointer **36** is removed from the vicnity of the needles by moving longitudinally under the indirect action of the spring **26**.

While I have illustrated and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. A retractable electric needle protector for a knitting machine having an electric stop motion, comprising a member for attachment upon a part of a knitting machine so that said member moves relatively to and along the knitting needles of said machine, a plunger movable relative to said member from a forward to a retracted position and back to a forward position, resilient means urging said plunger into said retracted position, an electric circuit for connection with the electric stop motion of said knitting machine and including a circuit opener and closer synchronized with said plunger for closing said circuit when said plunger is retracted, a pointer connected with said plunger and having a pointed end for location as close as possible to the stitches being knitted by said knitting machine when said plunger is in its forward position and retractable by said plunger in order to be spaced a relatively large distance from said stitches when said plunger is retracted, resilient means for urging said pointer slightly laterally to a normal position in order that lumps of foreign material forming at the knitting needles of said knitting machine may move said pointer out of said normal position, and latch means operating between said member and said pointer and including engaging keeper elements for holding said pointer forwards when said pointer is in its lateral normal position and said keeper elements disengaging when said pointer is moved laterally out of said normal position in order that said first named resilient means may retract said plunger and said pointer.

2. A retractable electric needle protector for a knitting machine having an electric stop motion, comprising a member for attachment upon a part of a knitting machine so that said member moves relatively to and along the knitting needles of said machine, a plunger movable relative to said member from a forward to a retracted position and back to a forward position, resilient means urging said plunger into said retracted position, an electric circuit for connection with the electric stop motion of said knitting machine and including a circuit opener and closer synchronized with said plunger for closing said circuit when said plunger is retracted, a pointer connected with

said plunger and having a pointed end for location as close as possible to the stitches being knitted by said knitting machine when said plunger is in its forward position and retractable by said plunger in order to be spaced a relatively large distance from said stitches when said plunger is retracted, resilient means for urging said pointer slightly laterally to a normal position in order that lumps of foreign material forming at the knitting needles of said knitting machine may move said pointer out of said normal position, and latch means operating between said member and said pointer and including engaging keeper elements for holding said pointer forwards when said pointer is in its lateral normal position and said keeper elements disengaging when said pointer is moved laterally out of said normal position in order that said first named resilient means may retract said plunger and said pointer, said member being cylindrical, and said plunger being slidably mounted in said cylindrical member.

3. A retractable electric needle protector for a knitting machine having an electric stop motion, comprising a member for attachment upon a part of a knitting machine so that said member moves relatively to and along the knitting needles of said machine, a plunger movable relative to said member from a forward to a retracted position and back to a forward position, resilient means urging said plunger into said retracted position, an electric circuit for connection with the electric stop motion of said knitting machine and including a circuit opener and closer synchronized with said plunger for closing said circuit when said plunger is retracted, a pointer connected with said plunger and having a pointed end for location as close as possible to the stitches being knitted by said knitting machine when said plunger is in its forward position and retractable by said plunger in order to be spaced a relatively large distance from said stitches when said plunger is retracted, resilient means for urging said pointer slightly laterally to a normal position in order that lumps of foreign material forming at the knitting needles of said knitting machine may move said pointer out of said normal position, and latch means operating between said member and said pointer and including engaging keeper elements for holding said pointer forwards when said pointer is in its lateral normal position and said keeper elements disengaging when said pointer is moved laterally out of said normal position in order that said first named resilient means may retract said plunger and said pointer, said member being cylindrical, and said plunger being slidably mounted in said cylindrical member, said first named resilient means comprising a spring within said cylindrical member and acting between said plunger and cylindrical member.

4. A retractable electric needle protector for a knitting machine having an electric stop motion, comprising a member for attachment upon a part of a knitting machine so that said member moves relative to and along the knitting needles of said machine, a plunger movable relative to said member from a forward to a retracted position and back to a forward position, resilient means urging said plunger into said retracted position, an electric circuit for connection with the electric stop motion of said knitting machine and including a circuit opener and closer synchronized with said plunger for closing said circuit when said plunger is retracted, a pointer

connected with said plunger and having a pointed end for location as close as possible to the stitches being knitted by said knitting machine when said plunger is in its forward position and retractable by said plunger in order to be spaced a relatively large distance from said stitches when said plunger is retracted, resilient means for urging said pointer slightly laterally to a normal position in order that lumps of foreign material forming at the knitting needles of said knitting machine may move said pointer out of said normal position, and latch means operating between said member and said pointer and including engaging keeper elements for holding said pointer forwards when said pointer is in its lateral normal position and said keeper elements disengaging when said pointer is moved laterally out of said normal position in order that said first named resilient means may retract said plunger and pointer, said member being cylindrical, and said plunger being slidably mounted in said cylindrical member, said circuit opener and closer including said plunger and an insulated contact, and said plunger engaging against said insulated contact in its retracted position for closing said electric circuit.

5. A retractable electric needle protector for a knitting machine having an electric stop motion, comprising a member for attachment upon a part of a knitting machine so that said member moves relatively to and along the knitting needles of said machine, a plunger movable relative to said member from a forward to a retracted position and back to a forward position, resilient means urging said plunger into said retracted position, an electric circuit for connection with the electric stop motion of said knitting machine and including a circuit opener and closer synchronized with said plunger for closing said circuit when said plunger is retracted, a pointer connected with said plunger and having a pointed end for location as close as possible to the stitches being knitted by said knitting machine when said plunger is in its forward position and retractable by said plunger in order to be spaced a relatively large distance from said stitches when said plunger is retracted, resilient means for urging said pointer slightly laterally to a normal position in order that lumps of foreign material forming at the knitting needles of said knitting machine may move said pointer out of said normal position, and latch means operating between said member and said pointer and including engaging keeper elements for holding said pointer forwards when said pointer is in its lateral normal position and said keeper elements disengaging when said pointer is moved laterally out of said normal position in order that said first named resilient means may retract said plunger and said pointer, said member being cylindrical, and said plunger being slidably mounted in said cylindrical member, said pointer being connected with said plunger with a pivot, and said second named resilient means comprising a spring acting between said pointer and said plunger.

6. A retractable electric needle protector for a knitting machine having an electric stop motion, comprising a member for attachment upon a part of a knitting machine so that said member moves relatively to and along the knitting needles of said machine, a plunger movable relative to said member from a forward to a retracted position and back to a forward position, resilient means urging said plunger into said retracted position, an electric circuit for connection with the electric stop motion of said knitting machine and

including a circuit opener and closer synchronized with said plunger for closing said circuit when said plunger is retracted, a pointer connected with said plunger and having a pointed end for location as close as possible to the stitches being knitted by said knitting machine when said plunger is in its forward position and retractable by said plunger in order to be spaced a relatively large distance from said stitches when said plunger is retracted, resilient means for urging said pointer slightly laterally to a normal position in order that lumps of foreign material forming at the knitting needles of said knitting machine may move said pointer out of said normal position, and latch means operating between said member and said pointer and including engaging keeper elements for holding said pointer forwards when said pointer is in its lateral normal position and said keeper elements disengaging when said pointer is moved laterally out of said normal position in order that said first named resilient means may retract said plunger and said pointer, said member being cylindrical, and said plunger being slidably mounted in said cylindrical member, said pointer being connected with said plunger with a pivot, and said second named resilient means comprising a spring acting between said pointer and said plunger, said pivot comprising a pintle pin mounted on said plunger and a notch in the side of said pointer engaging said pintle pin.

7. A retractable electric needle protector for a knitting machine having an electric stop motion, comprising a member for attachment upon a part of a knitting machine so that said member moves relatively to and along the knitting needles of said machine, a plunger movable relative to said member from a forward to a retracted position and back to a forward position, resilient means urging said plunger into said retracted position, an electric circuit for connection with the electric stop motion of said knitting machine and including a circuit opener and closer synchronized with said plunger for closing said circuit when said plunger is retracted, a pointer connected with said plunger and having a pointed end for location as close as possible to the stitches being knitted by said knitting machine when said plunger is in its forward position and retractable by said plunger in order to be spaced a relatively large distance from said stitches when said plunger is retracted, resilient means for urging said pointer slightly laterally to a normal position in order that lumps of foreign material forming at the knitting needles of said knitting machine may move said pointer out of said normal position, and latch means operating between said member and said pointer and including engaging keeper elements for holding said pointer forwards when said pointer is in its lateral normal position and said keeper elements disengaging when said pointer is moved laterally out of said normal position in order that said first named resilient means may retract said plunger and said pointer, said member being cylindrical, and said plunger being slidably mounted in said cylindrical member, said pointer being connected with said plunger with a pivot, and said second named resilient means comprising a spring acting between said pointer and said plunger, said spring being housed in an opening formed in said plunger.

8. A retractable electric needle protector for a knitting machine having an electric stop motion, comprising a member for attachment upon a part

of a knitting machine so that said member moves relatively to and along the knitting needles of said machine, a plunger movable relative to said member from a forward to a retracted position and back to a forward position, resilient means urging said plunger into said retracted position, an electric circuit for connection with the electric stop motion of said knitting machine and including a circuit opener and closer synchronized with said plunger for closing said circuit when said plunger is retracted, a pointer connected with said plunger and having a pointed end for location as close as possible to the stitches being knitted by said knitting machine when said plunger is in its forward position and retractable by said plunger in order to be spaced a relatively large distance from said stitches when said plunger is retracted, resilient means for urging said pointer slightly laterally to a normal position in order that lumps of foreign material forming at the knitting needles of said knitting machine may move said pointer out of said normal position, and latch means operating between said member and said pointer and including engaging keeper elements for holding said pointer forwards when said pointer is in its lateral normal position and said keeper elements disengaging when said pointer is moved laterally out of said normal position in order that said first named resilient means may retract said plunger and said pointer, said keeper elements comprising a notch in the side of said pointer and an edge portion on said member engageable by said notch.

9. A retractable electric needle protector for a knitting machine having an electric stop motion, comprising a member for attachment upon a part of a knitting machine so that said member moves relatively to and along the knitting needles of said machine, a plunger movable relative to said member from a forward to a retracted position and back to a forward position, resilient means urging said plunger into said retracted position, an electric circuit for connection with the electric stop motion of said knitting machine and including a circuit opener and closer synchronized with said plunger for closing said circuit when said plunger is retracted, a pointer connected with said plunger and having a pointed end for location as close as possible to the stitches being knitted by said knitting machine when said plunger is in its forward position and retractable by said plunger in order to be spaced a relatively large distance from said stitches when said plunger is retracted, resilient means for urging said pointer slightly laterally to a normal position in order that lumps of foreign material forming at the knitting needles of said knitting machine may move said pointer out of said normal position, and latch means operating between said member and said pointer and including engaging keeper elements for holding said pointer forwards when said pointer is in its lateral normal position and said keeper elements disengaging when said pointer is moved laterally out of said normal position in order that said first named resilent means may retract said plunger and said pointer, said member being cylindrical, and said plunger being slidably mounted in said cylindrical member, and a stem mounted on said plunger and protruding from said cylindrical member in order that said pointer may be moved to its forward position by moving said plunger by engaging and moving said stem, and said stem serving

as a signal for indicating whether said needle protector is "off" or "on."

10. A retractable electric needle protector for a knitting machine having an electric stop motion, comprising a member for attachment upon a part of a knitting machine so that said member moves relatively to and along the knitting needles of said machine, a plunger movable relative to said member from a forward to a retracted position and back to a forward position, resilient means urging said plunger into said retracted position, an electric circuit for connection with the electric stop motion of said knitting machine and including a circuit opener and closer synchronized with said plunger for closing said circuit when said plunger is retracted, a pointer connected with said plunger and having a pointed end for location as close as possible to the stitches being knitted by said knitting machine when said plunger is in its forward position and retractable by said plunger in order to be spaced a relatively large distance from said stitches when said plunger is retracted, resilient means for urging said pointer slightly laterally to a normal position in order that lumps of foreign material forming at the knitting needles of said knitting machine may move said pointer out of said normal position, latch means operating between said member and said pointer and including engaging keeper elements for holding said pointer forwards when said pointer is in its lateral normal position and said keeper elements disengaging when said pointer is moved laterally out of said normal position in order that said first named resilient means may retract said plunger and said pointer, and means for attaching said member to said part of said knitting machine in various selective positions.

11. A retractable electric needle protector for a knitting machine having an electric stop motion, comprising a member for attachment upon a part of a knitting machine so that said member moves relatively to and along the knitting needles of said machine, a plunger movable relative to said member from a forward to a retracted position and back to a forward position, resilient means urging said plunger into said retracted position, an electric circuit for connection with

the electric stop motion of said knitting machine and including a circuit opener and closer synchronized with said plunger for closing said circuit when said plunger is retracted, a pointer connected with said plunger and having a pointed end for location as close as possible to the stitches being knitted by said knitting machine when said plunger is in its forward position and retractable by said plunger in order to be spaced a relatively large distance from said stitches when said plunger is retracted, resilient means for urging said pointer slightly laterally to a normal position in order that lumps of foreign material forming at the knitting needles of said knitting machine may move said pointer out of said normal position, and latch means operating between said member and said pointer and including engaging keeper elements for holding said pointer forwards when said pointer is in its lateral normal position and said keeper elements disengaging when said pointer is moved laterally out of said normal position in order that said first named resilient means may retract said plunger and said pointer, said member being cylindrical, and said plunger being slidably mounted in said cylindrical member, said pointer being connected with said plunger with a pivot, and said second named resilient means comprising a spring acting between said pointer and said plunger, said plunger having a slit, the back end of said pointer engaging in said slit, a pintle pin mounted across said slit, the back end of said pointer having a notch engaging said pin for forming said pivot, said plunger having an opening in the sides of said slit, and said spring being engaged in said opening and acting against the back end of said pointer for urging said pointer into said normal position.

EDWARD VOSSEN.

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The following references are of record in the file of this patent:

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