

Dec. 9, 1930.

R. G. JENNINGS

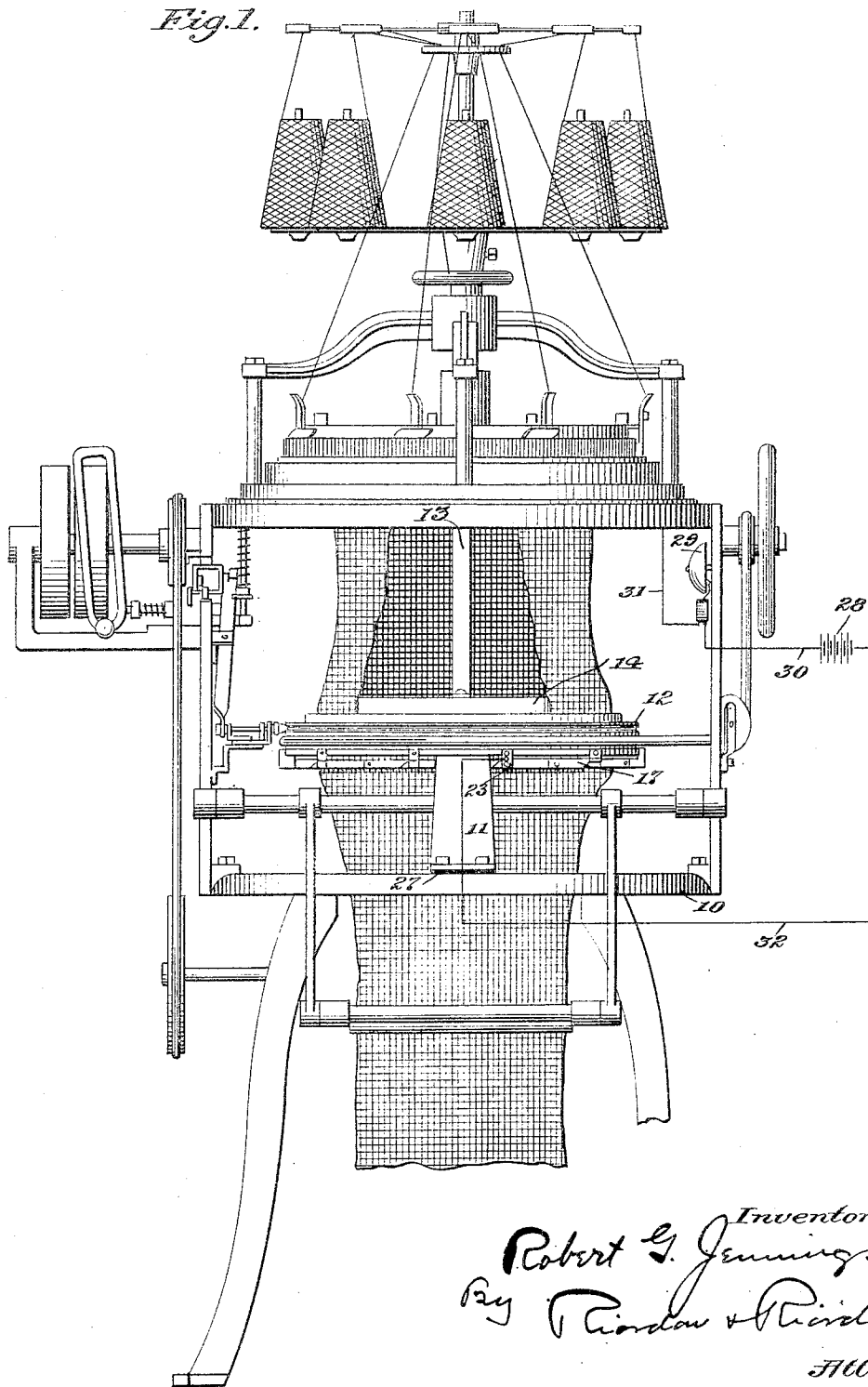
1,784,446

DETECTOR MECHANISM FOR KNITTING MACHINES

Filed Oct. 8, 1928

3 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

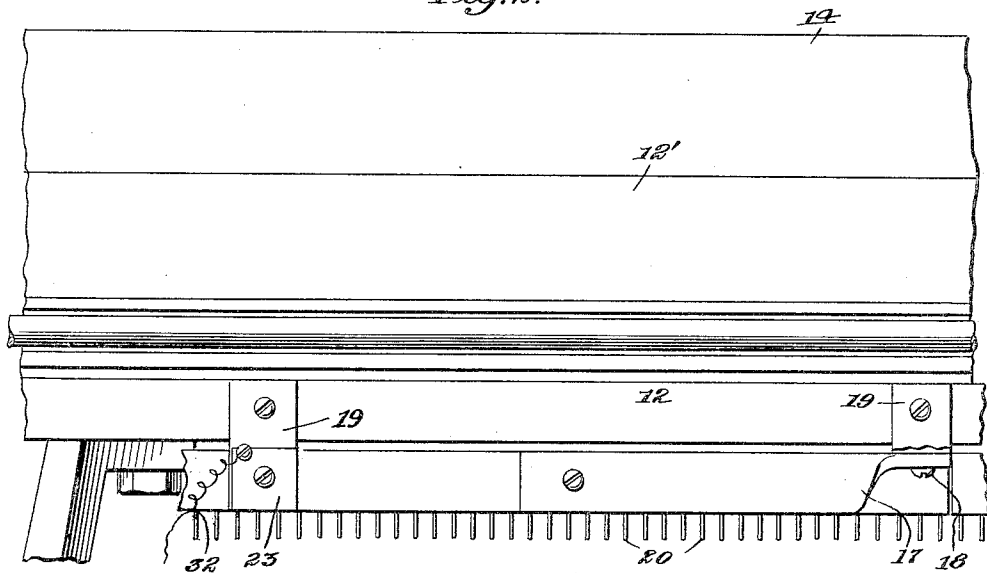
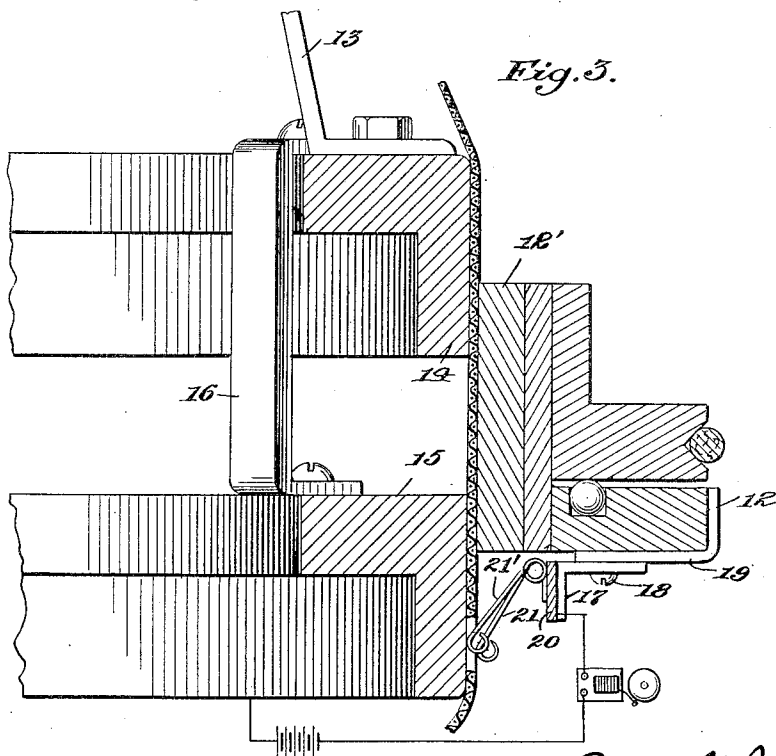


Fig. 3.



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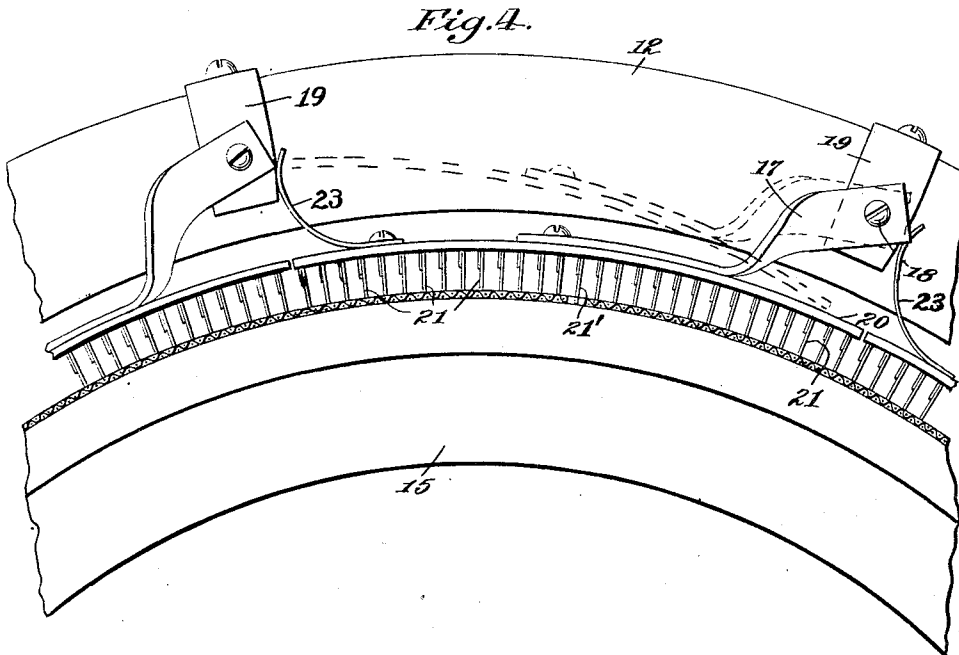
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DETECTOR MECHANISM FOR KNITTING MACHINES

Filed Oct. 8, 1928

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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DETECTOR MECHANISM FOR KNITTING MACHINES

Application filed October 8, 1928. Serial No. 311,070.

My invention relates to detector mechanism for knitting machines, such as may be used in connection with a visible or audible alarm or with a stop mechanism and it is an object of the invention to provide means of this character which shall effectively indicate a run-down or a split in the fabric. Such defects are caused by a broken or defective needle, and the hole detector will spot this place and will ring a bell or show a light or the like until the operator stops the machine, or the action of the detector may stop the machine if desired. This enables the operator to run more machines than usual, as he does not have to watch the cloth so closely for run-downs and splits.

Referring to the drawings, which are made a part of this application, and in which similar reference characters indicate similar parts:—

Fig. 1 is a front elevation of the machine illustrating the use of my device;

Fig. 2 is a detail elevation on a large scale;

Fig. 3, a partial section; and

Fig. 4 a bottom plan of parts shown in Fig. 3.

Referring to the drawings, Fig. 1, indicates generally a circular ribber of conventional type having a base plate 10 on which brackets 11 are supported, which brackets carry a ring 12 having a flange 12' either integral therewith or carried thereby closely adjacent to the outer surface of the tubular fabric being formed by the machine.

An expander ring inside the tube serves to hold the cloth close to ring 12 and mechanisms carried thereby. The expander ring is supported from the dial by one or more brackets 13 and in the form here shown consists of two rings 14 and 15 connected by U-shaped elements 16. The uppermost ring 14 coacts with devices shown in my co-pending application, Serial No. 293,474, filed on July 17th, 1928. The lower ring coacts with detector mechanism now to be described, and in the form of the invention here illustrated is stationary, the machine illustrated having a stationary dial and cylinder with revolving cams for operating the needles.

At the under side of the ring 12, I have secured to said ring a bracket 17 pivoted on a

screw 18, the screw either engaging the ring directly, or being operated therefrom by an angular slip of metal 19, of which there are several spaced about the ring 12, the bracket 17 carrying a plate 20 having secured thereto a number of hole detectors 21, here shown as in the form of short lengths of spring wire with a coil near the end which is attached to plate 20 and with a bent portion for contacting with the fabric.

Each of the bent free ends of the springs engages between two outer wales of the fabric and on occurrence of a split or run-down, such free end will be permitted to contact with the outer face of ring 15 as in the position indicated at 21' in Figs. 3 and 4. For holding the bracket 17 and plate 20 in position to cause the detectors to engage the fabric I have indicated an angular strip of spring metal 23 secured to each plate 20 and engaging the adjacent post 19 to hold the plate in place. It will be seen in Fig. 4 that this spring will hold the parts either in position for contacting with the fabric (or with the ring 15 in case of a hole in the fabric), or it will hold the parts in the dotted line position of Fig. 4 out of engagement with the fabric.

It is intended that there shall be as many detectors as there are spaces between cylinder needle wales, the detectors engaging in the sinker wales of a plain fabric or in the spaces between cylinder needle wales in a rib fabric; i. e., in the wales formed by the dial needles.

The plates 20 may be made of any convenient length and the detectors at adjacent ends of adjacent plates will be so located as not to leave any space unguarded. It will be understood that other means of supporting the plates are within the scope of my invention.

The supports 11 are insulated from the base plate as indicated at 27 in Fig. 1, and the ring 15 forms one end of a circuit of which the detectors 21 form the other end. As one possible arrangement of such a circuit I have illustrated a battery or other source of power at 28, this being connected to the bell 29 by a conductor 30, which is connected to the frame of the machine by another conductor 31. The battery is connected to the spring

detent 23 by a conductor 32 (Figs. 1 and 2) and it will be evident that on occurrence of a hole the corresponding detector will assume the position indicated at 22 in Fig. 3, closing the circuit and ringing the bell or actuating a stop mechanism or lighting a signal light in the circuit.

A counter for actuation each time a hole occurs is preferably mounted on the machine and provided with a ratchet actuated by electromagnetic means, each time the circuit is closed. Such a counter is a great convenience in the handling of the goods, as it permits application to the goods of tags showing the number of holes per package or bolt of cloth. This tag conveys information to the cutter as to the number of defective places, or it may indicate an entire bolt as material for "seconds."

It will be obvious to those skilled in the art that various modifications may be made in my device without departing from the spirit of my invention, and therefore, I do not limit myself to what is shown in the drawings and described in the specification, but only as indicated in the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In a circular knitting machine having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder and engaging the inner face of the cloth, an arcuate support outside the cloth, a series of resilient elements depending from said support to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, and an electric circuit connecting said ring and said elements.

2. In a circular knitting machine having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder and engaging the inner face of the cloth, an arcuate support outside the cloth, a series of resilient elements depending from said support to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, an electric circuit connecting said ring and said elements, and a signal in said circuit.

3. In a circular knitting machine having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder and engaging the inner face of the cloth, an arcuate support outside the cloth, movable into and out of an operative position a series of resilient elements depending from said support to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, an electric circuit connecting said ring and said elements, and holding means for said arcuate support effective to retain same in any position to which it may be moved,

said holding means forming a part of said circuit.

4. In a circular knitting machine having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder and engaging the inner face of the cloth, an arcuate support outside the cloth, a series of resilient elements depending from said support to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, an electric circuit connecting said ring and said elements, and a signal in said circuit, said signal being actuated by said resilient elements on fabric failure.

5. In a circular knitting machine having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder and engaging the inner face of the cloth, an arcuate support movable into and out of an operative position outside the cloth, a series of resilient elements depending from said support to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, an electric circuit connecting said ring and said elements, and an audible signal in said circuit, said signal being actuated by said resilient elements on fabric failure.

6. In a circular knitting machine having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder and engaging the inner face of the cloth, a set of independently movable arcuate supports arranged in a circle about the cloth, resilient elements depending from said support to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, an electric circuit connecting said ring and said elements, and a signal in said circuit.

7. In a circular knitting machine having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder and engaging the inner face of the cloth, a set of independently movable arcuate supports arranged in a circle about the cloth, catches holding the supports in position, resilient elements depending from said supports to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, an electric circuit connecting said ring and said elements, and a signal in said circuit.

8. In a circular knitting machine having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder and engaging the inner face of the cloth and a series of independent feelers supported in said machine and extending to a point opposite said ring for pressure against the outer surface of the cloth between adjacent needle wales.

9. In a circular knitting machine, having

a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder engaging the inner face of the cloth, an arcuate support outside the cloth movable into and out of an operative position, a series of resilient elements depending from said support to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, and holding means for said arcuate support effective to retain same in any position to which it may be moved.

10. In a circular knitting machine, having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder engaging the inner face of the cloth, an arcuate support outside the cloth, movable into and out of an operative position, a series of resilient elements depending from said support to a point opposite said ring and spaced to engage between successive, adjacent cylinder needle wales, an electric circuit connecting said ring and said elements, and means forming in a part of said electric circuit connecting said support and the machine.

11. In a circular knitting machine, having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder engaging the inner face of the cloth, an arcuate support outside the cloth movable into and out of an operative position, a series of resilient elements depending from said support to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, an electric circuit connecting said ring and said elements, and holding means for said arcuate support effective to retain same in any position to which it may be moved, and an audible signal in said circuit operable by said resilient elements on fabric failure.

12. In a circular knitting machine, having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder engaging the inner face of the cloth, an arcuate support outside the cloth movable into and out of an operative position, a series of resilient elements depending from said support to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, an electric circuit connecting said ring and said elements, and holding means for said arcuate support effective to retain same in any position to which it may be moved, and an audible signal in said circuit operable by said resilient elements on fabric failure, said holding means forming a part of said circuit.

13. In a circular knitting machine, having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder engag-

ing the inner face of the cloth, a support outside the cloth and forming with said expander ring a guide through which the cloth passes, an arcuate member mounted on said support to a point opposite said ring, a series of resilient elements depending from said arcuate member and spaced to engage between successive adjacent cylinder needle wales, said resilient members functioning as feelers to detect holes in the cloth as it passes thereby.

14. In a circular knitting machine, having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder engaging the inner face of the cloth, a support outside the cloth and forming with said expander ring a guide through which the cloth passes, an arcuate member mounted on said support, a series of resilient elements depending from said arcuate member to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, said resilient members functioning as feelers to detect holes in the cloth as it passes thereby, and an electric circuit connecting said expander ring and said elements.

15. In a circular knitting machine, having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder engaging the inner face of the cloth, a support outside the cloth and forming with said expander ring a guide through which the cloth passes, an arcuate member mounted on said support, a series of resilient elements depending from said arcuate member to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, said resilient members functioning as feelers to detect holes in the cloth as it passes thereby, and an electric circuit connecting said expander ring and said elements, and a signal in said circuit operable by said elements upon detection of a hole in the fabric.

16. In a circular knitting machine, having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder engaging the inner face of the cloth, a support outside the cloth and forming with said expander ring a guide through which the cloth passes, an arcuate member mounted on said support and movable relative thereto into and out of operative position, a series of resilient elements depending from said arcuate member to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, said resilient members functioning as feelers to detect holes in the cloth as it passes thereby.

17. In a circular knitting machine, having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder

engaging the inner face of the cloth, a support outside the cloth and forming with said expander ring a guide through which the cloth passes, an arcuate member mounted on said support and movable relative thereto into and out of operative position, a series of resilient elements depending from said arcuate member to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, and holding means for said arcuate member effective to retain same in any position to which it may be moved, said resilient members functioning as feelers to detect holes in the cloth as it passes thereby.

18. In a circular knitting machine, having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder engaging the inner face of the cloth, a support outside the cloth and forming with said expander ring a guide through which the cloth passes, an arcuate member mounted on said support and movable relative thereto into and out of operative position, a series of resilient elements depending from said arcuate member to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, said resilient members functioning as feelers to detect holes in the cloth as it passes thereby, and an electric circuit connecting said expander ring and said elements, and a signal in said circuit operable by said elements upon detection of a hole in the fabric.

19. In a circular knitting machine, having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder engaging the inner face of the cloth, a support outside the cloth and forming with said expander ring a guide through which the cloth passes, an arcuate member mounted on said support and movable relative thereto into and out of operative position, a series of resilient elements depending from said arcuate member to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, and holding means for said arcuate member effective to retain same in any position to which it may be moved, said resilient members functioning as feelers to detect holes in the cloth as it passes thereby, and an electric circuit connecting said expander ring and said elements, and a signal in said circuit operable by said elements upon detection of a hole in the fabric.

20. In a circular knitting machine, having a knitting cylinder, hole detecting mechanism including an expander ring approximating the diameter of said cylinder engaging the inner face of the cloth, a support outside the cloth and forming with said expander ring a guide through which the cloth passes, an arcuate member mounted on

said support and movable relative thereto into and out of operative position, a series of resilient elements depending from said arcuate member to a point opposite said ring and spaced to engage between successive adjacent cylinder needle wales, and holding means for said arcuate member effective to retain same in any position to which it may be moved, said resilient members functioning as feelers to detect holes in the cloth as it passes thereby, and an electric circuit connecting said expander ring and said elements, and a signal in said circuit operable by said elements upon detection of a hole in the fabric, said holding means forming a part of said circuit.

21. In a circular knitting machine, hole detecting mechanism including an expander ring engaging the inner face of the cloth, an arcuate support outside the cloth movable into and out of an operative position, a series of resilient elements depending from said support and spaced to engage between successive adjacent cylinder needle wales, and holding means for said arcuate support effective to retain same in any position to which it may be moved, said holding means comprising an abutment fixed to the machine and a spring mounted on said arcuate support and engageable with said abutment.

22. In a circular knitting machine, hole detecting mechanism including an expander ring engaging the inner face of the cloth, a support outside of the cloth and forming with said ring, a guide through which the cloth passes, an arcuate member mounted on said support and movable into and out of operative position relative thereto, a series of resilient elements depending from said member and spaced to engage between successive adjacent cylinder needle wales, holding means for said arcuate member, said holding means comprising an abutment fixed to the support, and a spring mounted on said arcuate member and engageable with said abutment.

23. In a circular knitting machine, hole detecting mechanism including an expander ring engaging the inner face of the cloth, an arcuate support outside of the cloth movable into and out of operative position, a series of resilient elements depending from said support and spaced to engage between successive adjacent cylinder needle wales, holding means for said arcuate support, said holding means comprising an abutment fixed to the machine, and a spring mounted on said arcuate support and engageable with said abutment, an electric circuit connecting said ring and said elements, said spring forming part of said circuit.

24. In a circular knitting machine, hole detecting mechanism including an expander ring engaging the inner face of the cloth, an arcuate support outside the cloth movable into and out of an operative position, a series

of resilient elements depending from said support and spaced to engage between successive adjacent cylinder needle wales, and holding means for said arcuate support effective to retain same in any position to which it may be moved, said holding means comprising an abutment fixed to the machine and a spring mounted on said arcuate support and engageable with said abutment, an electric circuit connecting said ring and said elements, said holding means forming a part of said circuit.

25. In a circular knitting machine, hole detecting mechanism including an expander ring engaging the inner face of the cloth, a support outside the cloth and forming with said expander ring a guide through which the cloth passes, an arcuate member mounted on said support and movable relative thereto into and out of operative position, a series of resilient elements depending from said arcuate member and spaced to engage between successive adjacent cylinder needle wales, and holding means for said arcuate member effective to retain same in any position to which it may be moved, said resilient members functioning as feelers to detect holes in the cloth as it passes thereby, said holding means comprising an abutment on said support and a spring mounted on said arcuate member and engageable with said abutment, an electric circuit connecting said ring and said elements, said holding means forming a part of said circuit.

In testimony whereof I hereunto affix my signature.

ROBERT G. JENNINGS.