April 2, 1957 E. VOSSEN 2,787,148

SECTIONAL FRAME FOR STOP MOTION DETECTING DEVICES

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FIG. 1.

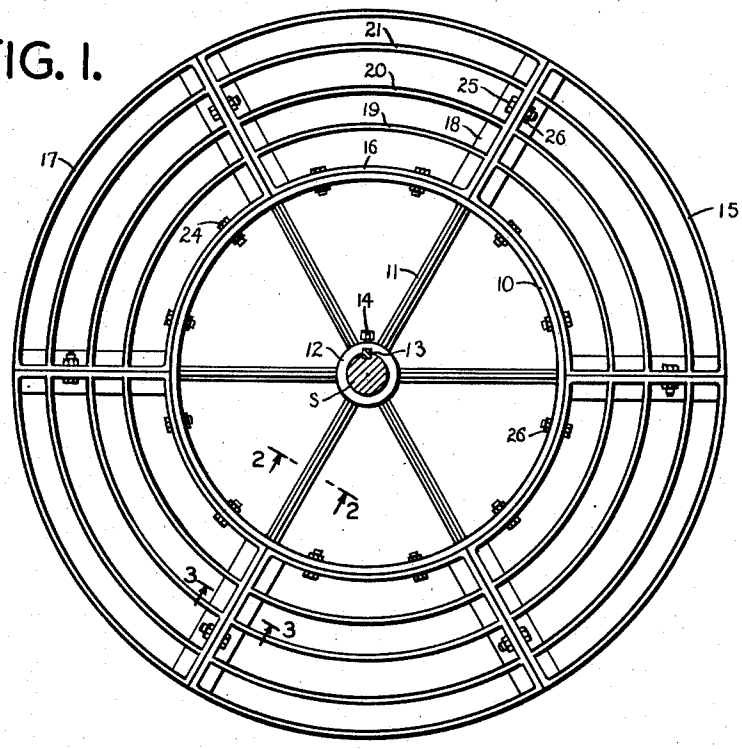


FIG. 2.

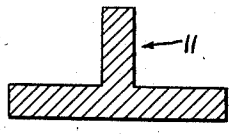
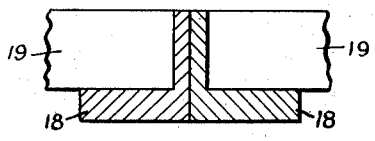


FIG. 3.



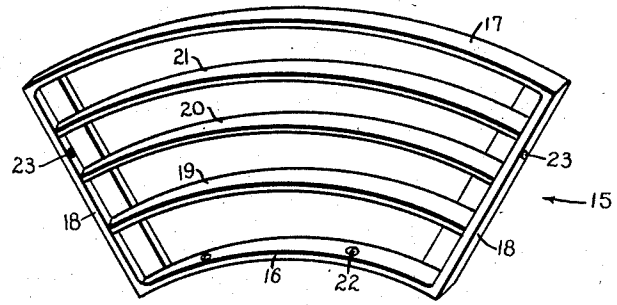


FIG. 4.

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FIG. 5.

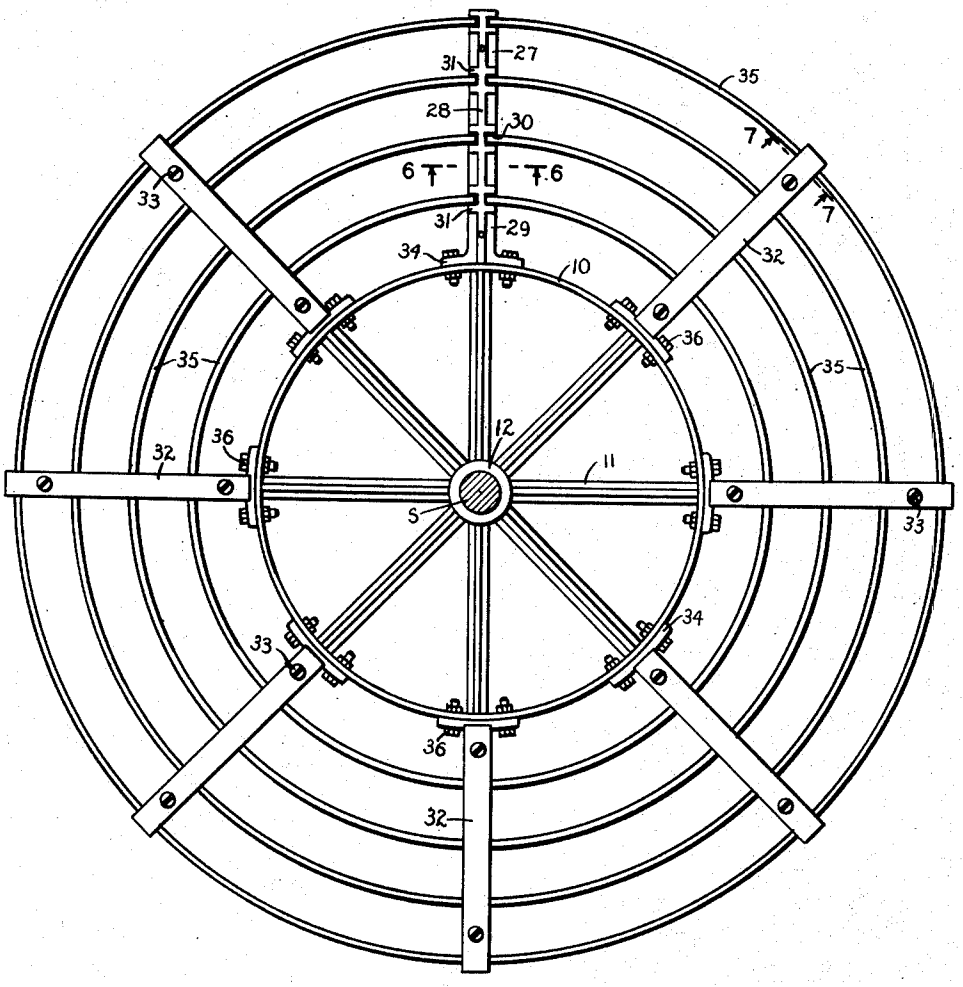


FIG. 6.

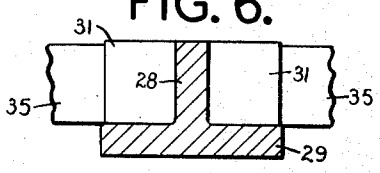
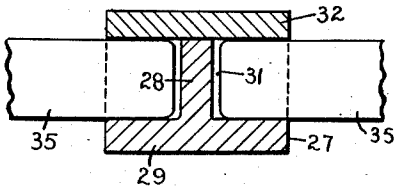


FIG. 7.



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SECTIONAL FRAME FOR STOP MOTION DETECTING DEVICES

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Application March 1, 1954, Serial No. 413,229

5 Claims. (Cl. 66—163)

This invention relates to the art of knitting machines for knitting underwear, outerwear, sportswear and the like and particularly concerns a novel sectional frame for stop motion detecting devices employed to monitor the threads fed to the knitting machines.

Today's modern knitting machine for underwear and outerwear and the like generally requires that a large number of threads be fed simultaneously to the needles of the machine. These threads are monitored by suitable stop motion devices which include broken or exhausted thread or yarn detectors. When one of the individual threads or yarns breaks or terminates or becomes unduly loose or slack, this condition is immediately detected and the stop motion device stops the operation of the machine. For the purposes of this invention and this application, the detecting mechanism which monitors and detects the broken, terminated or slack thread or yarn will herein be referred to as a stop motion detector. It will be understood that in the average knitting machine of the character under discussion, many such stop motion detectors are installed in suitable relation to the many threads or yarns which are fed through the machine.

In conventional installations, a frame is provided on the knitting machine to support the stop motion detectors. Depending upon the size and nature of the knitting machine and the number of threads which are fed through it, a suitable supporting frame for the stop motion detectors should be of the order of one to eight or more feet in diameter, depending upon the number of threads, and generally of circular shape. As many as 128 threads may be fed to the needles of a single machine. This frame supports the stop motion detectors, the wiring, wire connectors, signaling devices and such other apparatus as may be required in conventional installations. Referring now to the larger machines to which as many as 128 threads may be fed, it will be appreciated that a frame of this size and shape possesses considerable weight and is awkward and difficult to transport and install. In many cases its large size prevents passage through conventional doorways. In other cases, space is very limited at the precise place of installation and it is very difficult indeed to hoist the frame into place. If disassembly becomes necessary, the large size of the frame again presents difficult handling problems and should it be necessary to relocate the equipment, shipment of the frame again assumes serious proportions. Furthermore, the cost of casting or fabricating a one-piece frame of this size is very considerable and even excessive in relation to the results intended and produced. The cost is excessive simply because the frame is so large and not because it is intricate in design or involves large quantities of metal.

Moreover, conventional one-piece frames of the character under discussion are suitable for use in connection with a knitting machine of a given size only and they

are not interchangeable with either larger or smaller frames intended for installation on knitting machines of other given sizes. There has long been a definite need for stop motion detector frames of improved design, avoiding or eliminating the disadvantages above described.

The object of the present invention is the provision of a sectional frame for supporting stop motion detectors on knitting machines of every conventional size. This sectional frame is built around an inner core or frame which is small enough to be installed on the smallest knitting machines made. A plurality of outer sections may be secured to said inner core or frame to build up a larger frame suitable for use in connection with larger knitting machines. The outer sections may be made in various sizes so as to cooperate with the inner core or frame in forming larger frames of any desired diameter, such as six feet, seven feet, eight feet or even larger.

The inner core or frame is of generally circular shape and it consists of a hub which may be mounted on the knitting machine, a plurality of radially extending arms and a circular peripheral bar or rim on the outer ends of said arms. The outer sections may be made in at least two forms as illustrated in the drawing. In one form, each section consists of a generally arcuate sub-frame with a plurality of arcuate bars mounted therein. In the second form, each section consists of a pair of radially extending arms supporting a plurality of arcuate bars. In the first case the sub-frame is secured to the circular periphery of the inner frame or core and in the second case the radial arms of the outer sections are secured to said circular periphery. In either case, the outer sections may readily be mounted upon or demounted from the inner frame or core.

Other and further objects and advantages of the invention will become readily apparent from the following description taken together with the drawing, wherein:

Fig. 1 is a plan view of a stop motion detector frame embodying the invention.

Figs. 2 and 3 are sectional views taken on lines **2—2** and **3—3** of Fig. 1.

Fig. 4 is a plan view of an arcuate section employed in the frame of Fig. 1.

Fig. 5 is a plan view of a modified form of the invention.

Figs. 6 and 7 are sectional views taken on lines **6—6** and **7—7** of Fig. 5.

Referring now to the first form of this invention and to Figs. 1 to 4 inclusive, it will be noted that an inner frame or core is provided for mounting on vertical shaft S of a conventional knitting machine. This inner frame has the general shape of a spoked wheel and it consists of a tubular hub **12** which mounts on shaft S, a plurality of radially extending arms **11** projecting outwardly from said hub and a circular peripheral bar secured to the outer ends of said arms and identified in the drawing by the reference character **10**. If desired, a key element **13** may be provided in facing, registering grooves formed in said shaft and in the hub so as to prevent relative movement between the hub and shaft in either angular direction and a set screw **14** may be provided to secure said hub to said shaft. It is immaterial whether said set screw engages the shaft through the key or engages said shaft directly.

Removably secured to circular bar **10** is a plurality of outer sections **15**. Each outer section **15** consists of inner and outer arcuate bars **16** and **17** secured at their ends to radiaally extending side pieces **18**. Between said side pieces and between said inner and outer arcuate bars is a plurality of additional arcuate bars **19**, **20** and **21**.

Holes **22** are provided in the inner arcuate bar **16** and corresponding holes are formed in circular bar **10** of the

inner frame and bolts 24 bearing nuts 26 are provided in said holes to removably secure said arcuate bars 16 to the circular bar 10. It is by this means that the outer sections 15 as a whole are removably secured to said inner frame or core. The side pieces 18 of the several outer sections are also provided with registering holes 23 to receive bolts 25 bearing nuts 26 in order to secure the several outer sections to each other.

It will be noted that each outer section 15 occupies, in the illustrated form of this invention, sixty degrees of the frame as a whole. There are six outer sections and consequently when they are joined together and to the inner frame or core they describe a complete circle and form, together with the inner frame or core, a circular frame of the character herein described.

When the inner frame or core and the outer sections are all bolted together in the manner above described, a rigid frame assembly is provided to adequately support the stop motion detectors and all of the other apparatus which are to be mounted thereon. For shipping purposes, these several parts would be disassembled and the largest part would be the inner frame or core with a diameter of, say, fifty inches or larger or smaller, as desired. Each outer section may be approximately twenty inches wide along their respective side pieces 18, making a total diameter of the entire assembly approximately ninety inches, but this is purely illustrative and other dimensions may be provided in accordance with individual preferences or requirements.

The inner frame or core may be cast as a single unitary member and it may be made of aluminum, magnesium, gray iron or any other suitable material. If desired, this inner frame or core may be fabricated of separate parts either welded, riveted or bolted together or held together by any other suitable means. As shown in Fig. 2, arms 11 of the inner frame or core are made, preferably, of inverted T shape in cross section.

Each outer section 15 may also be cast as a unitary member of aluminum, magnesium or iron or any other suitable material. If desired, each said section may be fabricated of separate bars welded, riveted or bolted together or secured together by any other suitable means. It will be noted in Fig. 3 that each side piece 18 is L-shaped in cross section. The vertical web serves to provide structural strength and the horizontal web serves as a shelf to support the arcuate bars 19, 20 and 21. In this connection, it will be understood that each section 15 may comprise both a cast unit and fabricated parts. Thus the side pieces 18 and the inner and outer arcuate bars 16 and 17 may be cast together as a single integral unit and arcuate bars 19, 20 and 21 may be welded or otherwise secured at their respective ends to the two side pieces 18.

Turning now to Fig. 5 and to sectional views Figs. 6 and 7, it will be observed that in the second form of this invention the inner frame or core 10, 11, 12 may be basically similar to the inner frame or core above described in connection with the first form of this invention. A plurality of arms 27 are provided with flanges 34 at their inner ends. These flanges are arcuately shaped to rest snugly against the circular peripheral bar 10 of the inner frame. Registering holes are provided in said flanges 34 and circular bar 10 to accommodate bolts 36 in order to secure said flanges, and consequently said arms 27, to said circular bar 10. It will be observed in Fig. 5 that when arms 27 are thus secured to circular bar 10, said arms extend radially outwardly from said circular bar 10 in line with radial arms 11 on which said circular bar 10 is mounted. This alignment of arms is also true of the first form of this invention where it will be observed that side pieces 18 are mounted in alignment with arms 11.

Arms 27 are of generally inverted T-shape as Fig. 6 clearly shows. The vertical web is identified with the reference character 28 and the horizontal web with the reference character 29. A plurality of niches or sockets 30 are formed on horizontal web 29 on opposite sides of vertical web 28 by means of a plurality of partitions 31 which are formed transversely of each arm 27 on opposite sides of vertical web 28. Each arm 27 may constitute a single integral casting with flanges 34 and webs 28 and 29 and partitions 31 all cast as a single unitary member. The casting materal may be aluminum, magnesium, iron or any other suitable material.

A flat bar 32 may be provided on each arm 27 for a purpose which will shortly become apparent. This bar 32 may be secured to the vertical web 28 of each arm 27 by means of screws or bolts 33. It will be observed that bar 32 closes the tops of niches or sockets 30.

Arcuate bars 35 may be mounted in spaced concentric relation to each other on arms 27 by inserting their respective ends into niches or sockets 30. Bars 32 will prevent vertical displacement of said arcuate bars 35 from said sockets 30.

It follows from the foregoing that the outer sections in this second form of the invention are completely demountable since arcuate bars 35 may be removed from their supporting arms 27 and said supporting arms 27 may be removed from the inner frame or core. This renders it possible to ship or store the several parts of the entire assembly without any serious difficulty whatsoever.

The foregoing is illustrative of preferred forms of this invention and it will be understood that these preferred forms may be modified and other forms may be provided within the broad spirit of the invention and the broad scope of the claims.

I claim:

1. A supporting frame for stop motion detectors of knitting machines, comprising an inner frame, means for mounting said inner frame on a knitting machine, a plurality of radially extending arms detachably secured to said inner frame and projecting outwardly therefrom, and a plurality of arcuate bars supported on said radially extending arms in concentric relation with each other, said radially extending arms being provided with horizontal shelf portions supporting the ends of said arcuate bars and vertically extending partitions flanking the ends of said arcuate bars to maintain them in fixed positions relative to each other and relative to the inner frame, and means engaging said arcuate bars to prevent them from becoming dislodged from their respective positions on the radially extending arms.

2. A supporting frame in accordance with claim 1, wherein the arcuate bars are individually removable from the radially extending arms which support them, the means for preventing their dislodgment from said radially extending arms comprising a plurality of cover plates, one for each radially extending arm, said cover plates being detachably secured to said radially extending arms above and across the vertically extending partitions, thereby confining the arcuate bars to the horizontal shelf portions which support them and to their respective locations between the partitions.

3. In a knitting machine having a central post, a circular frame having an inner collar and an outer ring and radial arms connected at their inner ends to said inner collar and at their outer ends to said outer ring, said inner collar being adapted to be mounted on said central post to support said entire circular frame thereon, and a plurality of outer frames detachably secured to said circular frame, each of said outer frames having radially extending arms and arcuate bars on said radially extending arms concentric with each other and with the outer ring of the circular frame.

4. The combination of claim 3, wherein each outer frame comprises a pair of radially extending arms forming the sides of each said outer frame, an arcuate bar being secured at its ends to the outer ends of said radially extending arms, a second arcuate bar secured at its ends

to the inner ends of said radially extending arms, and a plurality of additional arcuate bars secured at one end to one of said radially extending arms and at the opposite end to the other of said radially extending arms, said additional arcuate bars being disposed intermediate the arcuate bars which are secured to the outer and inner ends of said radially extending arms, all of said arcuate bars being concentric with each other and the concentric bar which is secured to the inner ends of the radially extending arms being itself detachably secured to the outer ring of the circular frame, thereby supporting the entire outer frame on said circular frame, the adjoining radially extending arms of adjoining outer frames being themselves detachably secured to each other.

5. The combination of claim 3, wherein each outer frame comprises a pair of radially extending arms which are secured at their inner ends to the outer ring of the circular frame, a plurality of pockets being formed on said radially extending arms and a plurality of arcuate bars mounted on said radially extending arms with their ends removably seated in said pockets, and cover plates removably secured to said radially extending arms across said pockets to retain the arcuate bars therein.

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