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ADJUSTABLE NEEDLE-BED MOUNT FOR CIRCULAR KNITTING MACHINES

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Fig. 1.

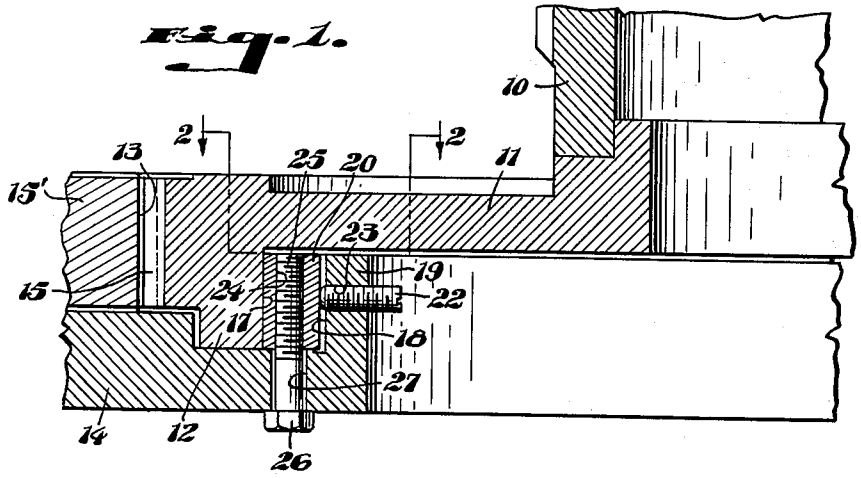


Fig. 2.

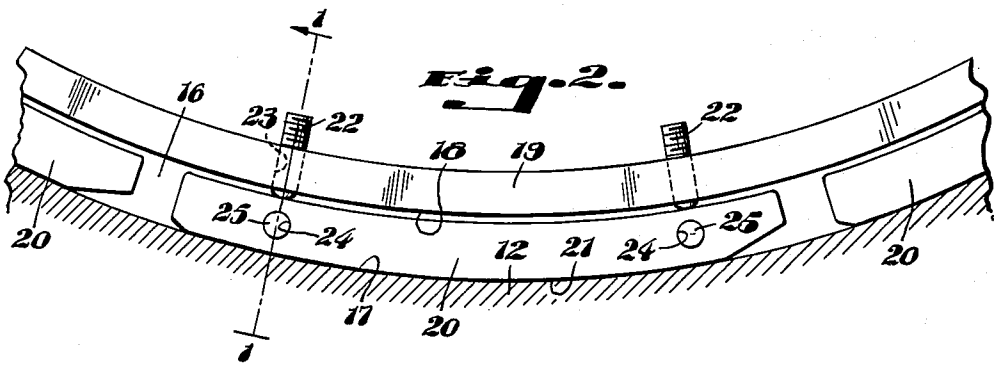
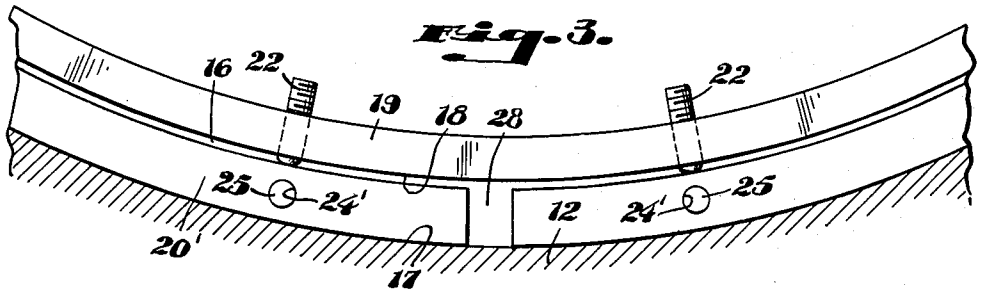


Fig. 3.



INVENTOR.

BERNARD JULES ERNEST LEBOCEY,

BY:

Harold B. Hood.

ATTORNEY.

United States Patent Office

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ADJUSTABLE NEEDLE-BED MOUNT FOR CIRCULAR KNITTING MACHINES

Bernard Jules Ernest Lebocey, Troyes, France

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5 Claims. (Cl. 66—8)

A circular knitting machine comprises a cylinder which carries the vertical needle bed, a cam ring which must be accurately coaxially associated with the cylinder in order to operate the needles, and another needle-carrying cylinder or a circular needle-carrying plate known as a "dial." Absolute concentricity of these parts, throughout the life of the knitting machine is, of course, essential to satisfactory operation of the machine.

The present invention is concerned with means for attaining and maintaining that concentricity; and the primary object of the invention is to provide a mounting means for a rotatable element or elements, of such character as to facilitate both the initial assembly of such a machine, to provide for the necessary concentricity, and the maintenance of the machine to restore such concentricity after wear.

Further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, my invention may be embodied in the forms illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific constructions illustrated and described, so long as the scope of the appended claims is not violated.

Fig. 1 is a fragmentary sectional view of an embodiment of the invention, taken substantially on the line 1—1 of Fig. 2;

Fig. 2 is a fragmentary plan view, taken in the plane indicated by the section line 2, 2 of Fig. 1; and

Fig. 3 is a view similar to Fig. 2 but showing a modification.

Referring more particularly to the drawings, a fragment of a conventional needle cylinder is indicated at 10, said cylinder being provided with a ring 11 having an accurately machined annular flange 12 adapted to be received in the annular channel 13 of the "upper plate" 14 of an otherwise conventional, circular knitting machine. The ring 11 is externally provided with a peripheral series of gear teeth 15 with which meshes a driving pinion 15', also in accordance with conventional practice.

According to the present invention, the channel 13 is so proportioned and designed as to have a radial dimension substantially greater than that of the ring flange 12, whereby an annular space 16 is defined between the inner surface 17 of the flange 12 and the surface 18 of the inner wall 19 of the channel 13. An interrupted ring is disposed in the space 16 to provide an accurate and adjustable bearing upon which the surface 17 of the flange 12 is guided for rotation. In the form of the invention illustrated in Fig. 2, said interrupted ring comprises a plurality of relatively short, arcuate pieces 20, arranged in an annular series, the external surfaces 21 of said pieces being accurately machined to conform precisely to the surface 17 of the ring flange 12. Each piece 20 is backed by two or more fine-pitch screws 22, each disposed in a threaded bore 23 substantially radially penetrating the

channel wall 19. Each such screw 22 bears upon the concave surface of its associated piece 20, adjacent an end thereof, whereby the position of each piece 20 within the channel space 16 may be accurately and delicately adjusted. Obviously, each screw 22 is capable of exerting a radially-outward force upon the corresponding end of its associated piece 20.

Substantially in line with each screw 22, each piece 20 is formed with a threaded bore or socket 24 into which takes a clamping screw 25 having a shank portion disposed in a slot 27 which penetrates the bottom wall of the channel 13; and each such screw 25 is formed with a head 26 which, when the screw is fully seated, clampingly engages the outer surface of the ring 14 to retain its piece 20 against movement. As is clearly shown in Fig. 1, the radial dimension of each slot 27 exceeds the diameter of that portion of the screw shank which is disposed within the slot, whereby such screw may move, radially with respect to the channel 13, during adjustment of its associated piece 20.

It will be clear that, by individual adjustment of the several screws 22, which are peripherally spaced about the wall 19, absolute concentricity of the ring 11 (and so of the needle cylinder 10) with respect to the other parts of the machine can be readily attained. It will be equally clear that, as the coacting surfaces 17 and 21 become worn after long use of the machine, such wear can be compensated by further adjustment of the pieces 20, without loss of concentricity.

Advantageously, the channel 13 may be flooded with lubricant.

In Fig. 3, I have illustrated an alternative form of my invention, possessing many of the advantages of the preferred form above-described. According to Fig. 3, the multiple pieces 20 are replaced by a single, continuous ring 20' interrupted only at the point 28. The same series of screws 22, correspondingly spaced, will be used with the ring 20' whereby, at least to some extent, individual integers of the single interrupted ring may be separately adjusted in position; and preferably, the ring 20' will be provided with a number of bores 24' equal to the number of screws 22, each bore 24' receiving a clamping screw 25, in the manner above-described.

It will be recognized that the plate 14 normally carries the above-mentioned cam ring; or that it may itself constitute the cam ring.

I claim as my invention:

1. In combination, a base formed to provide an annular channel, an element mounted in said channel for rotation about the axis of said channel, that surface of said element adjacent one wall of said channel being toothed, gear means mounted adjacent said base and meshing with the teeth of said element, an interrupted ring received in said channel between said element and the opposite wall of said channel, and a plurality of members supported from said last-named wall for substantially radial adjustment relative thereto, said members engaging said ring at peripherally-spaced points to urge the same into bearing engagement with said element.

2. In combination, a base formed to provide an annular channel, an element mounted in said channel for rotation about the axis of said channel, an interrupted ring received in said channel between said element and one wall of said channel, a plurality of members supported in said channel wall for substantially radial adjustment relative thereto, said members engaging said ring at peripherally-spaced points to urge the same into bearing engagement with said element, said interrupted ring comprising an annular series of arcuate pieces, and means securing each such piece against peripheral movement.

3. The combination of claim 2 in which the last-named

means comprises, for each such piece, a screw adjacent each end of such piece, each screw penetrating the floor of said channel and taking into a threaded bore in its piece, each such screw having a head clampingly engaging the external surface of said base, when seated.

4. The combination of claim 3 in which each such screw passes through a slot having a radial dimension substantially exceeding the diameter of that portion of the screw which is disposed in such slot.

5. In a circular knitting machine, a plate formed to provide an annular channel, a needle bed cylinder provided with an annular element received in said channel

for rotation, an interrupted ring received in said channel between said element and one wall of said channel, and a plurality of members supported in said channel wall for substantially radial adjustment relative thereto and engaging said ring at peripherally-spaced points to urge the same into bearing engagement with said element.

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