Sept. 15, 1964 K. KULCZYCKI 3,148,519

WARP KNITTING MACHINE

Filed June 19, 1962 2 Sheets-Sheet 1

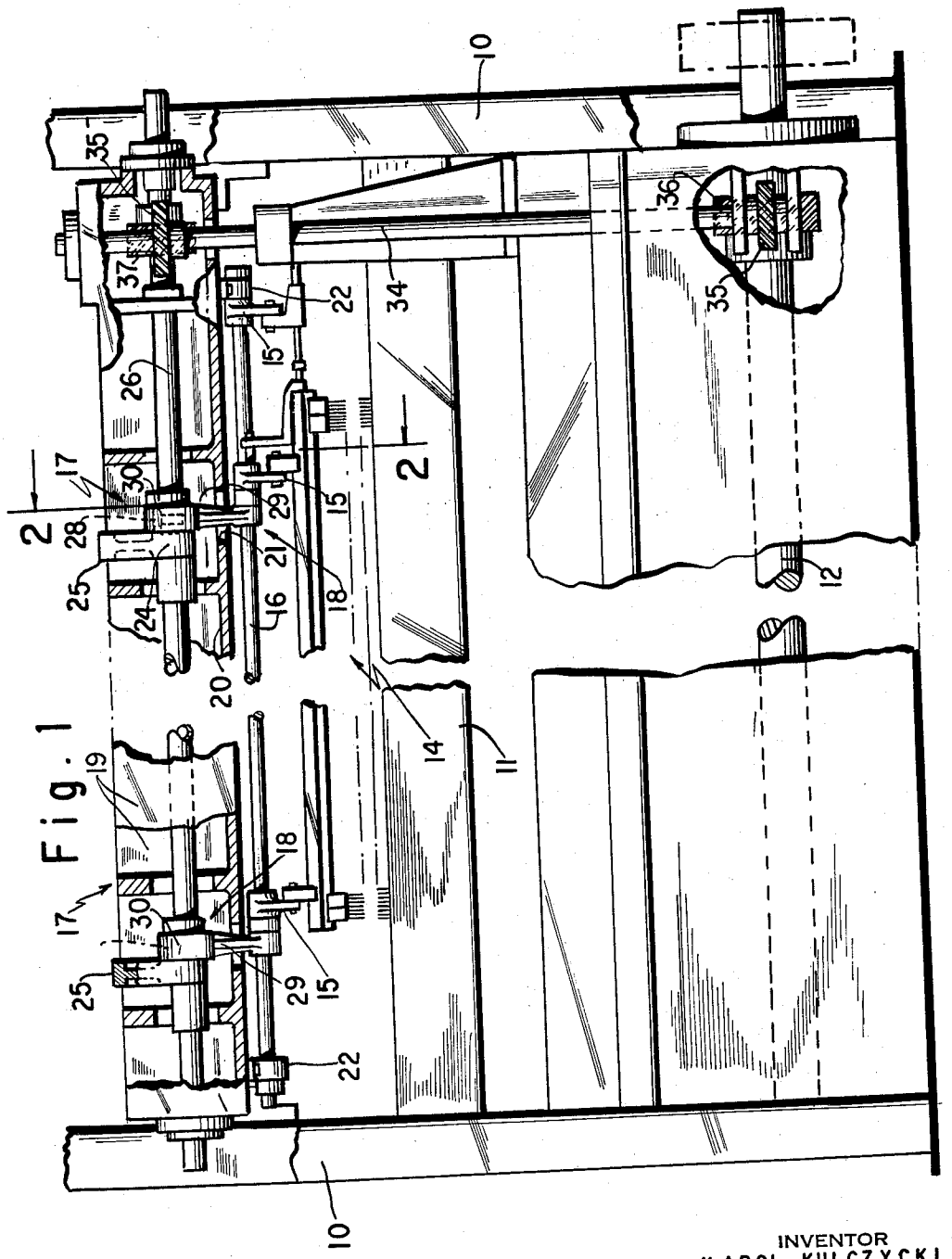


Fig. 1

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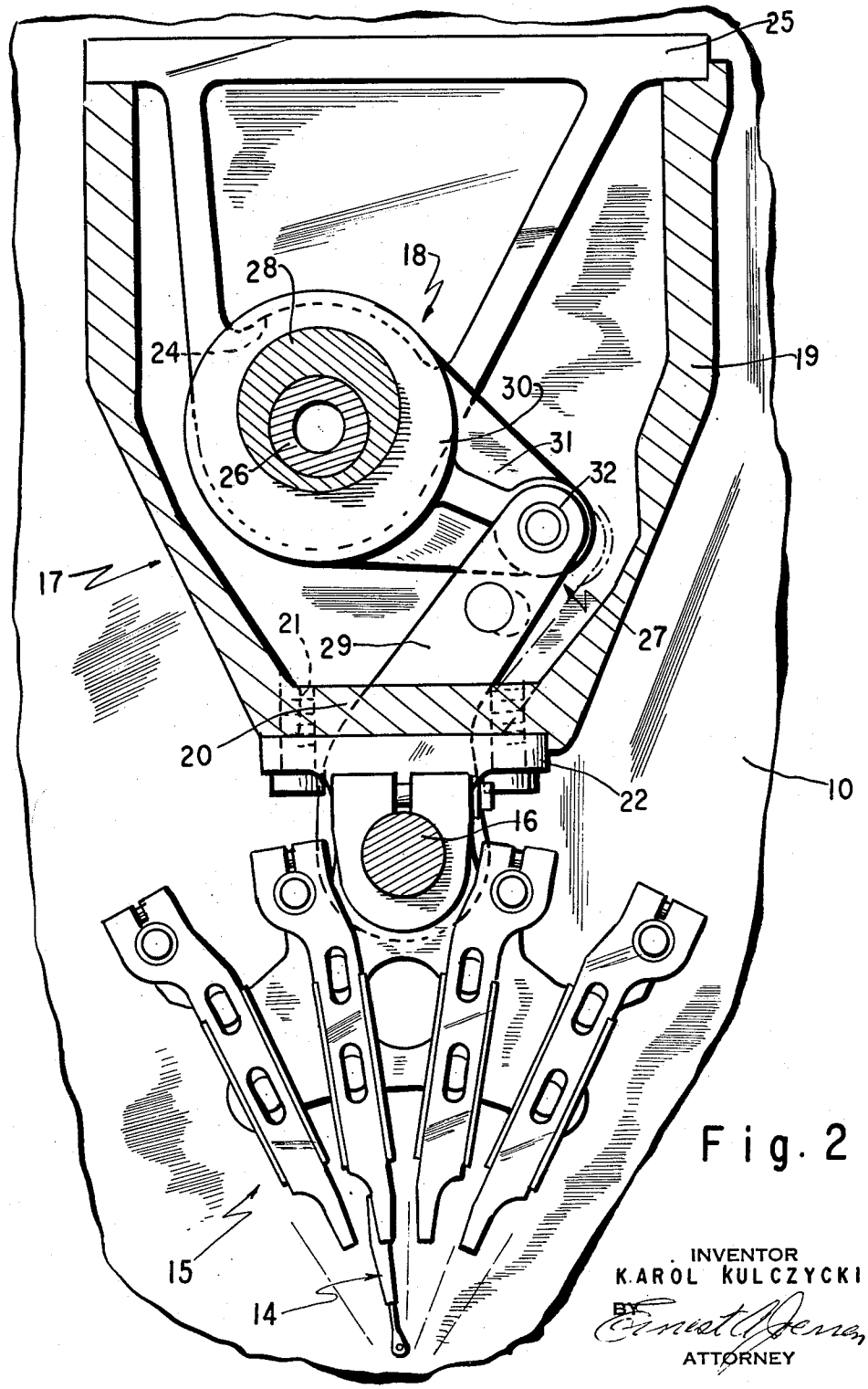


Fig. 2

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WARP KNITTING MACHINE

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1 Claim. (Cl. 66—86)

The present invention relates to warp knitting machines and, more particularly, to an improved arrangement of the mechanism for effecting rocking of the guide bar rock shaft.

The present invention is concerned with warp knitting machines of the type which generally comprise a frame for supporting one or more needle bars and one or more guide bars above the needle bars, a guide bar rock shaft coacting with means for moving the guide bars endwise to lap yarn on the needles, and a main drive shaft or cam shaft having cams thereon provided with linkage for effecting up and down movement of the needle bars and for effecting rocking movement of the guide bar rock shaft.

Heretofore, the cam shaft has been located below the needle bars near the base of the frame, whereby the linkage for actuating the guide bar rock shaft extended upwardly in front or in back of the needle and guide bars. Usually, several lengthwise spaced guide bar rock shaft actuating cams equipped with such upwardly extending linkage have been provided to avoid twisting of the rock shaft and the guide bars as would happen if it were actuated only from one end thereof. The number of such cams and linkages required increases with the width of the knitting machine, that is the length of the rock shaft, and with the speed at which the machine is operated.

The manner in which such linkage is located prevents free access to the guide bars for threading and replacing broken ends, and prevents removal and replacement of guide bars or needle bars without first disconnecting and removing the linkage and thereafter reassembling the linkage. The latter operation is time consuming, particularly if a considerable number of cam linkages are present as in modern high speed machines, and may lead to difficulties if the linkages are not properly aligned in the reassembly thereof.

Accordingly, an object of the present invention is to provide an improved guide bar rock shaft actuating arrangement for warp knitting machines wherein such upwardly extending linkage and its attendant disadvantages are eliminated.

Another object is to provide such an arrangement which permits free access to the guide bars and needle bars for both threading and removal and replacement without removal of the rock shaft linkage.

Another object is to provide such an arrangement which facilitates the use of a large number of lengthwise spaced means for rocking the guide bar rock shaft in a more direct manner whereby the knitting machines can be safely operated at high speed without twisting the rock shaft.

Another object is to provide such an arrangement which improves the frame construction of the knitting machine, decreases the overall weight of the machine and at the same time conceals the mechanism for actuating the rock shaft rocking means.

A further object is to provide such an arrangement which is simple, practical and economical in construction, and is reliable in operation.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claim, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description, and is shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a fragmentary, somewhat schematic front elevational view, partly in section of a warp knitting machine embodying the present invention.

FIG. 2 is an enlarged sectional view taken along the line 2—2 on FIG. 1.

Referring now to the drawings in detail, there is shown a warp knitting machine which generally comprises a pair of upright frame members 10, a needle bar 11 mounted for support by the frame members in any suitable manner, a main shaft or cam shaft 12 mounted between the frame members near the base thereof, a conventional drive for the shaft 12 (not shown), conventional cams (not shown) on the shaft 12 for moving the needle bar up and down, a guide bar 14 above the needle bar supported by hangers 15 on a guide bar rock shaft 16, and conventional mechanism for effecting longitudinal movement of the guide bar (not shown).

In furtherance of the present invention, a horizontal trough or channel member 17 is connected to and between the frame member 10 to provide a rigid construction capable of supporting the weight of the guide bar rock shaft 16 and the elements thereof and actuating mechanism 18 for the rock shaft in the manner described hereinafter. The channel member has a pair of side walls 19 connected by a bottom wall 20 provided with lengthwise spaced openings 21. The rock shaft 16 is mounted on the underside of the bottom wall 20 by suitable lengthwise spaced bearings 22.

The guide bar rock shaft actuating mechanism 18 comprises a plurality of lengthwise spaced bearings 24 supported by brackets 25 positioned between the side walls 19 of the channel member and secured to the upper ends of the side walls (FIG. 2), a drive shaft 26 rotatably mounted by the bearings 24, and connecting means 27 operable by the drive shaft 26 for rocking the rock shaft 16. The means 27 preferably include an eccentric 28 on the drive shaft 26, a lever 29 having one end secured to the rock shaft 16 and extending upwardly through an opening 21 in the bottom wall 20 of the channel member, and a follower 30 for the eccentric 28 having an arm 31 pivotally linked to the other end of the lever 29 at 32 whereby rocking motion is imparted to the shaft 16 by the eccentric. Such means are provided for each of the openings 21, and any large number of such means may be utilized because the direct connecting linkage between the rock shaft 16 and the drive shaft 26 does not obstruct any area of the knitting elements where free access thereto may be desired. The channel member 17, in addition to its structural features, provides a casing for concealing the rock shaft actuating mechanism 18 to improve the appearance of the machine.

The drive shaft 26 is driven by the main shaft 12 through a vertical connecting shaft 34 journalled for rotation on one of the frame members 10 and having a gear 35 at each end thereof respectively meshing with a gear 36 on the shaft 12 and a gear 37 on the shaft 26 (FIG. 1). Such a driving connection may be provided at either or both ends of the shaft 26.

From the foregoing description, it will be seen that the arrangement in accordance with the present invention, eliminates the use of goosenecks, frames or other structural members and actuating arms in the area of the knitting elements either in front or behind the knitting elements and the guide bars which might interfere with threading or replacing of yarn ends, facilitates easy, quick removal of the guide bars and needle bars, and increases the overall efficiency and productivity of the machine be-

cause of the reduced downtime for attending the yarn ends. Also by eliminating the conventional large cams on the main shaft for actuating the rock shaft and long actuating arms and linkage extending from the cams near the base of the machine to the rock shaft and substituting compact eccentric and short levers for such elements, less mass is moved to effect rocking of the guide bar rock shaft whereby safe operation of the machine at high speed is feasible. All this is provided by a sturdy and durable arrangement which is simple and economical in construction.

As various changes may be made in the form, construction and arrangement of the parts herein, without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in any limiting sense.

I claim:

In a warp knitting machine, the combination of a pair of frame members; a needle bar supported by said frame members; a channel member connected to and between said frame members, said channel member having upright side walls and a bottom wall formed with lengthwise spaced openings facing said needle bar from a location above said needle bar; a plurality of lengthwise spaced brackets between said side walls and secured to and suspended from the upper ends of said side walls, said brackets having axially aligned bearings each located to one side of one of said openings; a drive shaft rotatably mounted in said bearings; means for driving said drive shaft; a plurality of lengthwise spaced axially aligned bearing members on the underside of said bottom wall; a guide bar rock shaft rotatably mounted in said bearing members; a plurality of levers each having an end secured to said rock shaft and extending upwardly through one of said openings; a plurality of lengthwise spaced eccentrics on said drive shaft each adjacent one of said bearings and each including a follower and a laterally extending arm; and means for pivotally linking each of said arms to the upper end of one of said levers.

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