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CAM AND FOLLOWER MECHANISM FOR STRAIGHT KNITTING MACHINES

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FIG. 1.

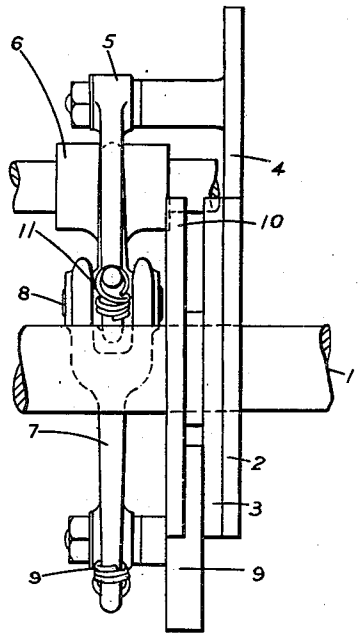
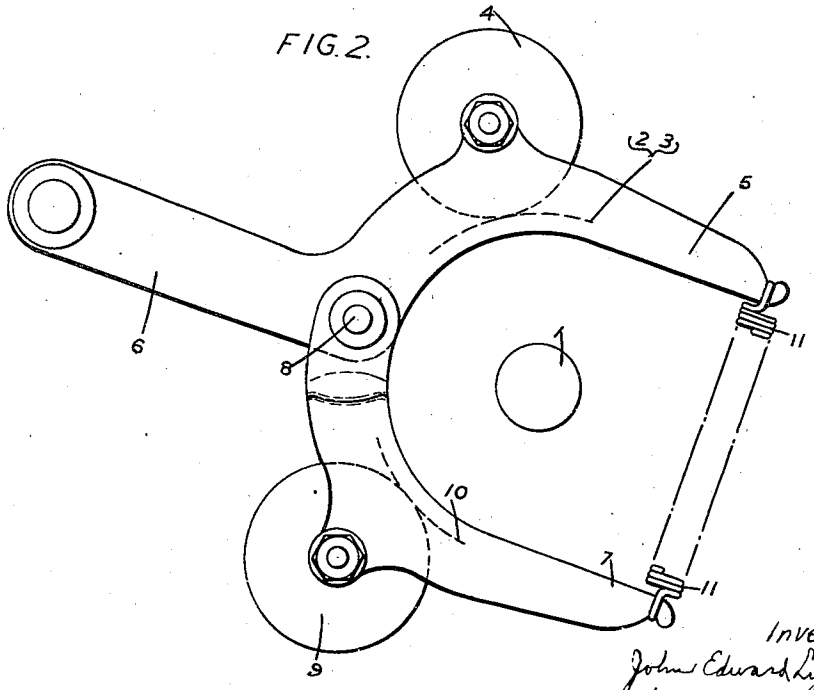


FIG. 2.



Inventor
John Edward Lynam
by Stevens and Davis
his Attorneys

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CAM AND FOLLOWER MECHANISM FOR STRAIGHT KNITTING MACHINES

John Edward Lynam, Mapperley, Nottingham, England, assignor to William Cotton Limited, Loughborough, Leicestershire, England

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5 Claims. (Cl. 66—82)

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In knitting machines, particularly Cotton's Patent and other straight bar knitting machines, it is customary to operate certain devices each by mechanism comprising a rotary cam and a truck lever carrying a truck or cam follower engaging said cam, and to cause the truck to press against the cam and to follow its contours by means of a return spring extending between the lever and a fixed anchorage. Particularly in straight bar knitting machines the devices (e. g. the needle bar or catch bar) to be moved have considerable inertia and since a spring has to move its device while the follower is descending the flank of the cam the spring needs to be very strong. It therefore follows that the strong spring throws a considerable load on the machine while the follower is ascending a flank of the cam, and since at one period the spring pressure assists rotation of the cam and at another resists it the torque required to drive the cam fluctuates heavily with a consequent detriment to smooth running of the machine. Further, it is difficult to turn the machine by hand and to stop at a given stage, for the spring pressure will often cause the machine to run backward or forward from said stage. An object of the invention is a construction that eliminates or mitigates these disadvantages.

The present invention provides, in a knitting machine, operating mechanism comprising a cam, a counter cam coaxial therewith, a member movable by the cams, two opposed relatively-movable cam followers carried by said member one for engaging the cam and the other the counter cam, and a spring urging said cam followers towards one another. This spring causes the followers to grip the cams between them, but since while one follower is ascending a flank of the cam the other follower is descending a counterpart flank of the counter cam the spring pressure and the torque do not vary appreciably, the load on the machine is reduced, and a comparatively light spring may be employed.

In Cotton's Patent and other straight bar knitting machines it is necessary in many instances, to impart slightly varying motions at different times to a device (such for example as a needle bar) and this is effected by providing two or more alternate cams having different profiles and by shogging them, or the truck to bring either of them into operation on the truck as required. According to a feature of the present invention, where a plurality of alternative cams are provided any of which may be caused to operate on one of the cam followers, there is a single counter

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cam which operates constantly on the other follower irrespective of which of the alternative cams is in operation. This is achieved by making the counter cam or its follower, or both, of such a face width that the shogging operation does not move them out of operative register.

It will be understood that if the profile or timing of the two alternative cams differs, the counter cams cannot be an exact counterpart of both of them; it may be a counter part of one of them (or a compromise between a counter part of each of them) in which case as the cams rotate the spacing between the followers, and the spring pressure, will vary slightly, but this variation will not be sufficient (or will only occur at restricted periods in the running of the machine, or when the machine speed is low, as for example in fashioning) to have a pronounced deleterious effect.

The foregoing and other features of the invention set out in the appended claims are incorporated in the construction which will now be described as an example of the application thereof to a Cotton's Patent knitting machine, with reference to the accompanying drawing in which:

Figure 1 is a front elevation showing the relevant parts of the machine and mechanism, and

Figure 2 is a side elevation thereof.

On the shogging cam shaft 1 there are two alternative cams 2, 3 (e. g. a knitting cam and a fashioning cam) either of which may be brought, by shogging the cam shaft 1, into operative register with a truck or follower 4 on an arm 5 of a truck lever 6. The lever 6 has a second arm 7 hinged to it at 8 to extend at the opposite side of the cam shaft 1 to that at which the first arm 5 extends so that there is a cleft between the lever arm 5 and arm 7. The hinged arm 7 carries a second truck or follower 9, which, at a location opposed to the first truck 4, engages the periphery of a counter cam 10, on the shaft 1, which is an exact counterpart of one of the alternative cams 2, 3 (i. e. having a dip matching a lobe on the first cam, or a rise matching a fall and a fall matching a rise, and having such angular relation to the first cam that when the lobe or the like on the first cam is engaged with truck 4 said dip or the like on the counter cam is engaged with truck 9). A tension spring 11 extends between the ends of the arms 5, 7 biassing them together like nut-crackers and causing the trucks 4, 9 to grip the cams between them. This spring has a substantial leverage on the trucks.

When that one of cams 2, 3 whereof cam 10 is the counterpart, is in operation the arms 5, 7, will remain the same or substantially the same

distance apart, and will move a some without any appreciable variation in the spring tension. It will therefore be seen that the load on the machine is evened out, and that the machine may be stopped at any phase in the rotation of the cam shaft without danger of its running forward or backwards. The counter cam truck 9 is of such a width that the shogging of the cam shaft 1, to substitute one of the alternative cams (2, 3) for the other, does not remove the counter cam 10 from engagement with it, and the counter cam therefore operates while that one of the alternative cams, of which it is not the exact counterpart, is operating and at such times the two arms 5, 7 of the truck lever will open and close slightly and the spring tension will vary. Even so, the load on the machine is negligible in comparison with that obtained when the normal arrangement of return spring is employed, and even under these circumstances the torque on the cam shaft 1, occasioned by the spring load, is so slight that the machine may easily be turned by hand and there is no danger of the machine running forward or backwards from the stage at which it is brought to rest. Moreover, it is to be pointed out that the leverage that the spring 11 exerts over the trucks (about fulcrum 8) permit a comparatively weak spring to be used; moreover when a rise on cam 10 is acting on truck 9, the lever 6 is not moved in the clockwise direction (Fig. 2) merely through the pull of spring 11 on the free end of its arm 5 but is mainly moved by the reaction at the fulcrum 8.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare what we claim is:

1. In a knitting machine, particularly a Cotton's Patent or other straight bar knitting machine, having a plurality of alternative cams and a common member or follower upon which they are operable alternately, the combination of a

counter cam and a follower, upon which it is operative irrespective of which of the alternative cams is operative, and means connecting the second said follower to the first.

2. A machine according to claim 1, in which the counter cam is a counterpart of one of the alternative cams.

3. A machine according to claim 1, in which the counter cam is a compromise between a counterpart of each of the alternative cams.

4. In a straight bar knitting machine having a shogging cam shaft, a plurality of alternate cams thereon, a truck lever and a follower on it for engagement by said cams alternatively the combination of a counter cam on the cam shaft, a truck for engagement by said counter cam irrespective of shogging action of the cam shaft, which truck is opposed to the first truck, and spring means for urging the trucks together to grip the cam between them.

5. A machine according to claim 4, having an hinged arm carrying the second truck, and having said truck lever and arm movable substantially in unison about a common axis.

JOHN EDWARD LYNAM.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,822,597	Lieberknecht	Sept. 8, 1931
1,857,099	Lieberknecht	May 3, 1932
2,044,539	Meyer	June 16, 1936
978,783	Rose	Dec. 13, 1910

FOREIGN PATENTS

Number	Country	Date
329,216	Great Britain	May 15, 1930
578,192	Germany	June 10, 1933
452,048	Great Britain	Aug. 17, 1936
498,755	Germany	May 26, 1930