May 10, 1938. R. H. LAWSON ET AL 2,116,632

BUMPER BRACKET FOR KNITTING MACHINES

Filed Oct. 21, 1935 3 Sheets-Sheet 1

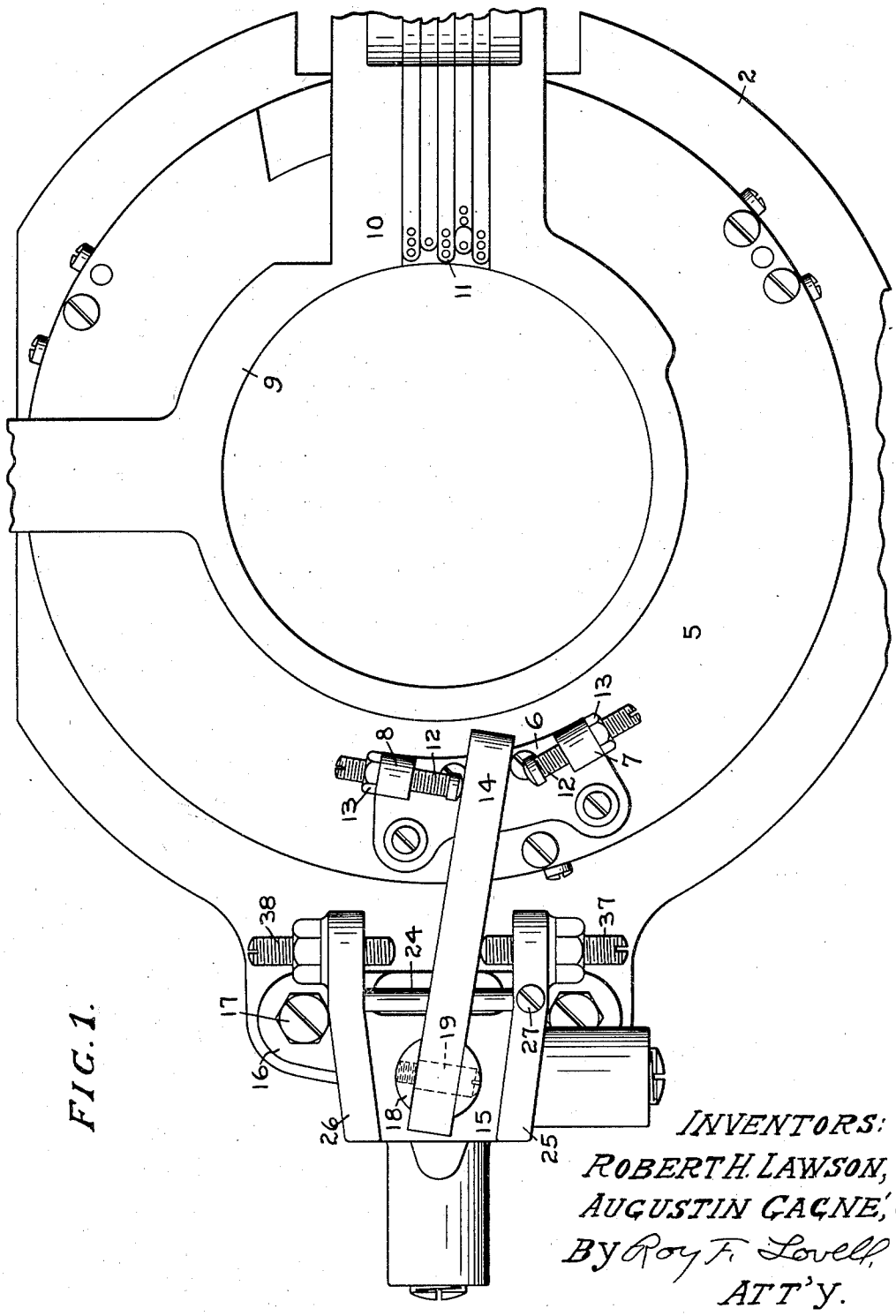


FIG. 1.

INVENTORS:
ROBERT H. LAWSON,
AUGUSTIN GAGNE,
By Roy F. Lovell
ATT'Y.

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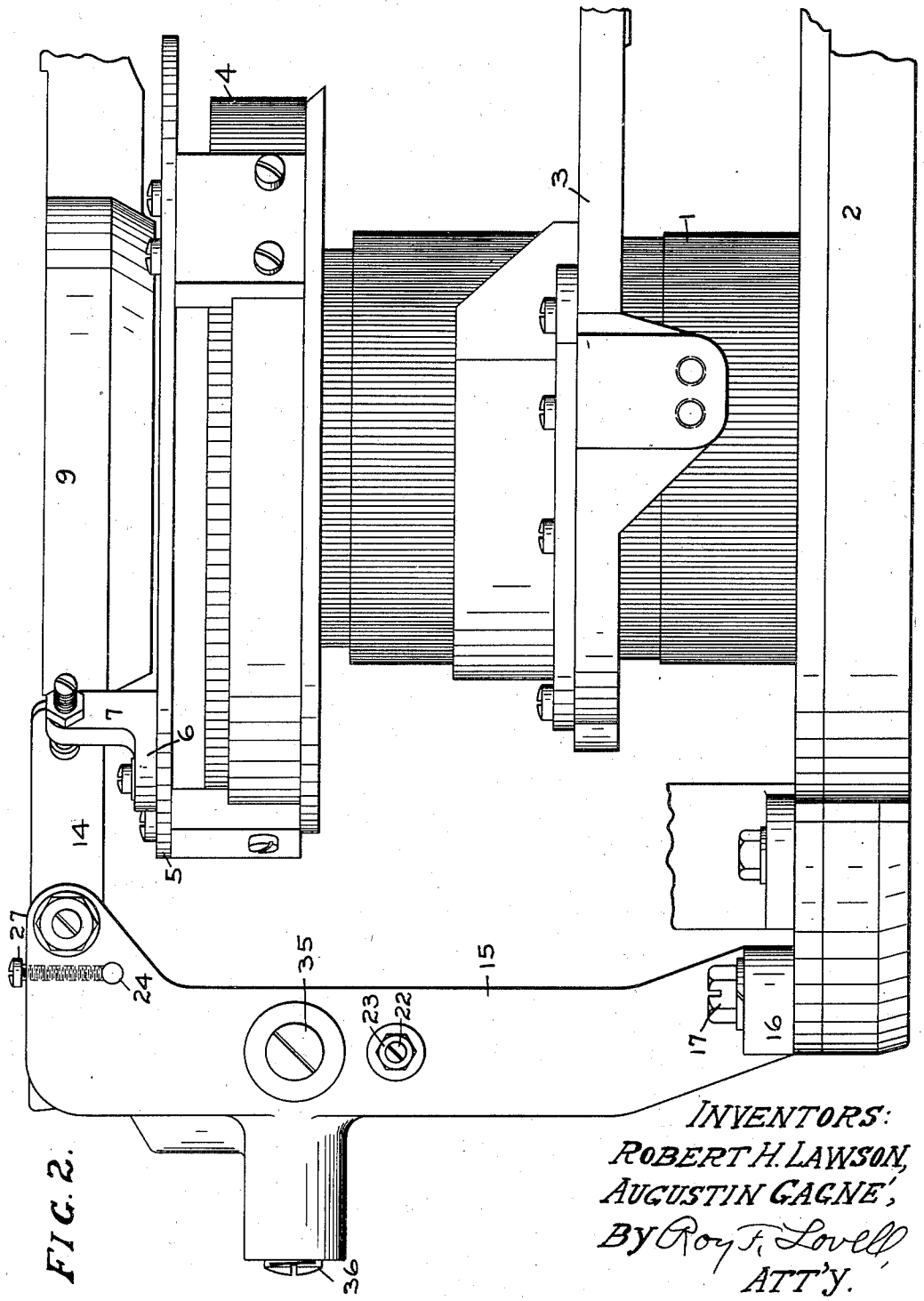


FIG. 2.

INVENTORS:
ROBERT H. LAWSON,
AUGUSTIN GAGNÉ,
By Roy F. Lovell
ATT'Y.

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FIG. 3.

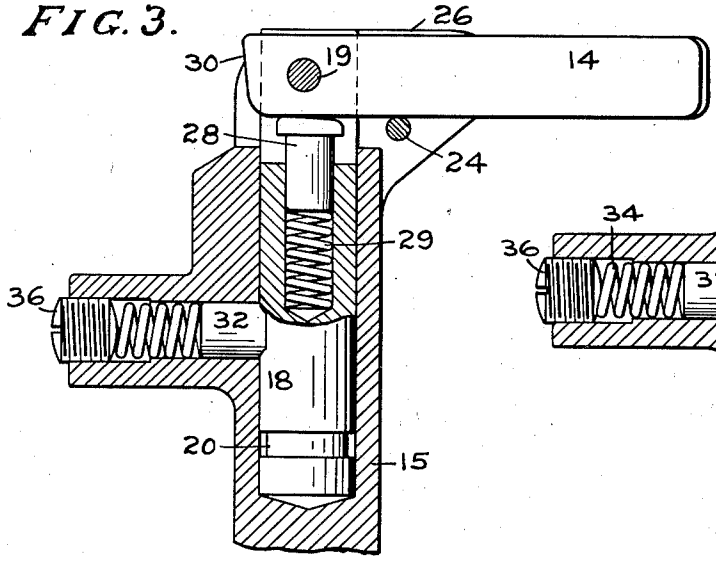


FIG. 4.

FIG. 5.

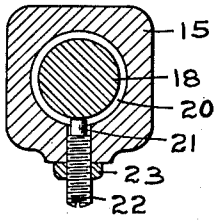


FIG. 6.

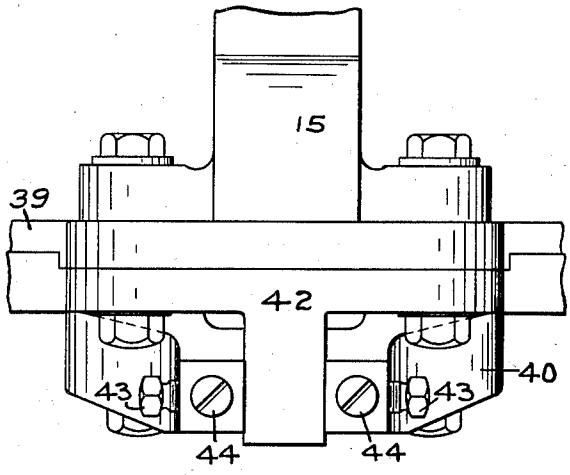
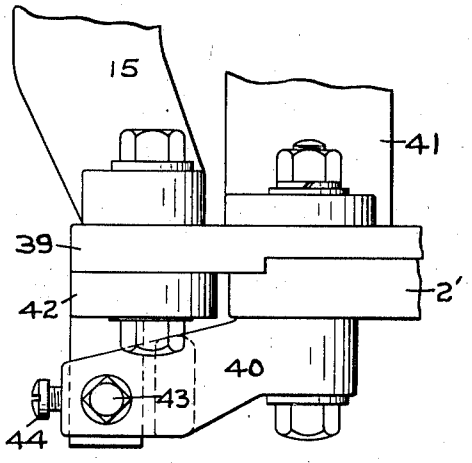


FIG. 7.



INVENTORS:
ROBERT H. LAWSON,
AUGUSTIN GAGNE',
By Roy F. Lovell,
ATT'Y.

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2,116,632

BUMPER BRACKET FOR KNITTING MACHINES

Robert H. Lawson, Pawtucket, and Augustin Gagné, Central Falls, R. I., assignors to Hemphill Company, Central Falls, R. I., a corporation of Massachusetts

Application October 21, 1935, Serial No. 45,936
In Canada October 26, 1934

9 Claims. (Cl. 66—107)

This invention deals with improvements in circular knitting machines, more particularly an improved bumper bracket for use in such machines, wherein the shock which occurs at the end of each oscillation of the sinker cap is automatically absorbed and the operation of the machine in general, improved thereby.

In the drawings:

Fig. 1 is a plan view showing certain common parts of a circular knitting machine and the novel mechanism which has been incorporated therewith;

Fig. 2 is an elevation of the device which has been shown in Fig. 1;

Fig. 3 is a sectional view showing in detail some of the parts of the bumper bracket itself;

Fig. 4 is a sectional view showing further detail of the mechanism of Fig. 3;

Fig. 5 is a sectional view showing the manner in which the spindle carrying the bumper arm is maintained in place;

Fig. 6 is an elevation showing the manner in which the bumper bracket is fastened to machines of older type; and

Fig. 7 is an elevational view showing the mechanism of Fig. 6 as seen from a different angle.

In the circular knitting machines of conventional type used for knitting hosiery the cylinder carrying the needles and also a sinker head with sinkers therein are rotated at certain times, and at other times, are oscillated as when producing the heel and toe of a stocking. The sinker cap which carries cams for engaging butts on sinkers rests upon the sinker head and is prevented from rotating by suitable stops thereon which bear against a portion of the latch ring assembly or more often, the latch ring post. When the machine is oscillated as in reciprocatory knitting, this sinker cap is also oscillated through a limited angle. The sinker cap has projections thereon which during reciprocatory knitting, bump against the latch ring post or some portion of the latch ring itself, and in so doing, vibrate that post and also the latch ring to a considerable extent. For this reason the latch ring post and the hinged connection between said post and ring by means of which the ring is swung upwardly out of active position have to be made extremely rigid and serviceable to avoid unnecessary vibration and premature wear. The constantly recurring shock which is attendant upon stopping of the sinker cap when it strikes a fixed stop at either end of its swing tends to disturb proper control of jacks and sinkers which may have been made within the sinker head such as when forming the heel and toe of a stocking in such machines as the Hemphill 12-step reverse plating machine. When the sinker cap of such a machine as that just mentioned strikes a fixed stop a very definite rebound occurs and the proper timing of sinker cams will be disturbed. As a result certain needles may cast off improperly, thus damaging the loops held thereon. While this bumper bracket is particularly useful in the type of machine just mentioned, we do not mean to convey the idea that it is in any way limited to such use, and the same will be both operative and useful in any circular knitting machine of the type wherein reciprocatory work is carried out either continuously or at intervals.

Referring to the figures of the drawings, a needle cylinder 1 is adapted to rotate or reciprocate by the usual mechanism (not shown). The circular base of the machine is shown at 2 and a portion of the cam carrying plate at 3. A sinker head is indicated at 4 and this sinker head is of the type wherein jacks having a plurality of butts are arranged to operate upon sinkers for reverse plating, drop stitch work and the like. A sinker cap is indicated at 5 and has a bracket attached thereto, said bracket being indicated by numeral 6 and having two upwardly extending projections 7 and 8 at its opposite ends. A latch ring 9 is of the usual type, being hinged upon a post (not shown) so that it may be swung upwardly out of the way for purposes of transferring a rib or other stocking top of the needles. The latch ring also carries on an extension 10 several yarn guides herein generally indicated by numeral 11. These guides are operated in the usual manner and since they form no important part of the present invention, no further description will be given.

During reciprocatory knitting the needle cylinder 1 and sinker head 4 as well as the needles and sinkers therein are oscillated back and forth throughout an angular extent somewhat approximating a complete revolution in either direction. The cap 5 and its attendant parts are necessarily oscillated to and fro throughout a comparatively small angular extent for reasons well known to those skilled in the art. Bracket 6 having upwardly extending projections 7 and 8 is provided with two adjustable screws 12 threaded within each of the extensions and these screws are locked in position by means of lock nuts 13. These screws act as stops to limit the swing of said cap in either direction as they bump against an arm 14 the purpose or function of which will be described later.

An upright post 15 is attached at its base 16 to

the circular base of the machine by means of suitable bolts 17 or other connection. The upper portion of this post has been drilled out for reception of a rotatable spindle 18 which has a split upper projecting portion within which is hinged to swing about a pivot 19, bumper arm 14. The spindle 18 is grooved at 20 so that it may be held in position axially by means of the cooperating point 21 of a screw 22, Figs. 2 and 5. This screw is held in properly adjusted position by means of a lock nut 23. Arm 14 is maintained in the position shown in Fig. 3 and it rests upon a pin 24 extending between the oppositely disposed projections 25 and 26 at the upper end of post 15. Pin 24 is held in position by a set screw 27. A plunger 28 having a spring 29 seating in element 18, bears upwardly against a portion of arm 14 to resiliently maintain said arm in either the position shown in Fig. 3 or a position about 90 degrees from that in which said plunger will bear against surface 30, thus holding the arm in a position wherein it will not interfere with the removal of the sinker cap or other portions of the sinker head assembly. It may be necessary to remove these elements at times when jacks are to be changed for changing pattern and at other desired intervals.

The spindle 18 is frictionally held against rotation within post 15 to offer resistance to the swing of arm 14 during each stroke or swing of the sinker cap. In the detail of Figs. 3 and 4 are shown two plungers 31 and 32 which bear against said spindle. Each of these plungers is free to move inwardly against said spindle under the presure of springs 33 and 34 which are held under compression by means of adjusting screws 35, 36. These screws may be adjusted until the proper amount of frictional resistance is offered to the rotation of spindle 18.

Two screws 37 and 38 are threaded within projections 25 and 26 and are adjustable to properly limit the swing of arm 14; each screw is maintained in this properly adjusted position by suitable lock nuts as shown.

In operation, the sinker cap will be swung to and fro to a limited angular extent as the needle cylinder reciprocates. Referring to Fig. 1, the parts are shown as the said cap has completed its movement in a counterclockwise direction. Upon the opposite movement contact screw 12 will bear against arm 14 and will swing that arm over to the extreme position where it contacts stop screw 30, but instead of swinging quickly into that position and stopping with a shock which was common to the structure of the prior art, sinker cap 5 and arm 14 will be moved more gradually due to the frictional resistance offered to the swing of said arm. At the completion of the swing there will be a comparatively light shock due to stopping the parts and no rebound will be experienced. As a result of employing the advantageous bumper bracket herein described, it is not necessary to provide an exceptionally rugged latch ring and post therefor, and the latch ring, its yarn guides and other mechanism will not be continuously vibrated as the sinker cap stops at opposite ends of its stroke. The entire sinker assembly will function in more perfect manner since there is no rebound to cause improper timing of the sinker cams or to disturb any of the mechanism which functions to operate the sinker jacks, etc.

In Figs. 6 and 7 a modified form of mechanism is shown for connecting the bumper post to the circular base of machines of older type. In older machines no provision was made for mounting post 15 which must have a very solid bearing. The circular base is shown at 2' and an extension 39 is bolted to this base 2' and a forked element 40 is also attached beneath said base 2', in the embodiment shown being held in place by the same bolts which hold the extension 39 and widening pick bracket 41. The post 15 is attached to this extension by means of suitable bolts which also extend down through an element 42 which serves to strengthen or reinforce extension 39 and holds that extension and the post 15 rigidly in position by means of a connection to the forked end of element 40. There are two oppositely disposed set screws 43 in the forked end of said element which are tightened against the downwardly projecting end of element 42, these set screws being held in fixed position by means of screws 44.

The description has been given relative to a machine of the Hemphill type having the 12-step selecting device for sinker reverse plating, drop stitch work or the like, but this is to be considered as illustrative only and by no means a limitation. The invention is useful on any circular knitting machine adapted to produce hosiery. We are not to be limited except by the scope of the appended claims.

We claim:

1. In a circular knitting machine of the revolving needle cylinder type, a normally stationary sinker cam cap for controlling the movements of sinkers, the said sinker cam cap, during reciprocatory movements of the needle cylinder, having a limited to and fro movement, cooperating engaging formations on the said sinker cap and on a stationary part of the knitting machine for limiting the said to and fro movements of the sinker cap during reciprocatory knitting, said limiting means including a movable member, the movements of which are friction-resisted.

2. A knitting machine having a sinker cap which moves to and fro during reciprocatory knitting, cooperating engaging formations on the sinker cap and on a stationary part of the knitting machine for limiting the to and fro movements of the sinker cap during reciprocatory knitting, said limiting means including a member mounted to swing on an axis for limiting the to and fro movements of the sinker cap, a friction element in engagement with the said member to resist swinging movements thereof so that the sinker cap has no tendency to rebound from its position at either end of its movements.

3. A bumper bracket adapted for attachment to a knitting machine and including a post, a bearing to support oscillatory movements of a member, a member mounted for oscillatory movements in said support and friction means, including one or more spring pressed plungers in engagement with that portion of the oscillatory member received within the post, for engaging the said member to act as a brake on its oscillatory movements.

4. A bumper bracket adapted for attachment to a knitting machine and including a post, a bearing to support oscillatory movements of a member, a member including a spindle mounted for oscillatory movements in said support and friction means operable on said spindle for engaging the same to act as a brake on its oscillatory movements, and means for maintaining the member for oscillatory movements in the post.

5. A bumper bracket adapted for attachment to a knitting machine and including a post, a

bearing to support oscillatory movements of a member, a member mounted for oscillatory movements in said support and friction means, including one or more spring pressed plungers in engagement with that portion of the oscillatory member received within the post, for engaging the said member to act as a brake on its oscillatory movements, and means for maintaining the member for oscillatory movements in the post.

6. A circular knitting machine having a rotary needle cylinder and stationary cam means for controlling the movements of the needles, a sinker head movable with the needle cylinder and a normally stationary sinker cap, the said sinker cap having to and fro movements during reciprocatory movements of the needle cylinder and sinker head, cooperating means associated with the sinker and a stationary part of the knitting machine for limiting the to and fro movements of the sinker cap, friction means for so acting upon the said limiting means as to serve as a buffer for the to and fro movements of the sinker cap.

7. A circular knitting machine having in combination a needle cylinder, a sinker head, and a sinker cap cooperating with said head and adapted to swing to and fro through a limited angle during reciprocatory knitting, means for stopping said cap at either extremity of its travel constructed and arranged for reducing the shock with which the movement of the cap is stopped and for preventing rebound, including a movable abutment, the movements of which are frictionally resisted.

8. A cylinder knitting machine having in combination a needle cylinder, a sinker head, and a sinker cap cooperating with said head and adapted to swing to and fro through a limited angle during reciprocatory knitting, means for stopping said cap at either extremity of its travel including a swinging member, means for limiting the swinging movement of said member and frictional means for resisting movement of said member for the purpose described.

9. A circular knitting machine having in combination a needle cylinder, a sinker head, needles and sinkers operatively associated with said cylinder and head and a sinker cap for imparting motion to said sinkers, said cap being adapted to swing throughout a limited angular extent during reciprocatory knitting, means for limiting the swinging movement of said cap including a post rigidly attached to said machine and extending upwardly in proximity to said cap, a spindle rotatable in said post and having pivoted thereto an arm extending inwardly toward said cap, oppositely disposed contact elements on said post for limiting the swing of said arm and means for retarding the movement of said spindle and arm as the arm swings between said contact elements.

ROBERT H. LAWSON.
AUGUSTIN GAGNÉ.