June 5, 1923. 1,457,903

A. GAGNÉ

WEB HOLDER CAM FOR KNITTING MACHINES

Filed May 7, 1920 2 Sheets-Sheet 1

Fig. 1.

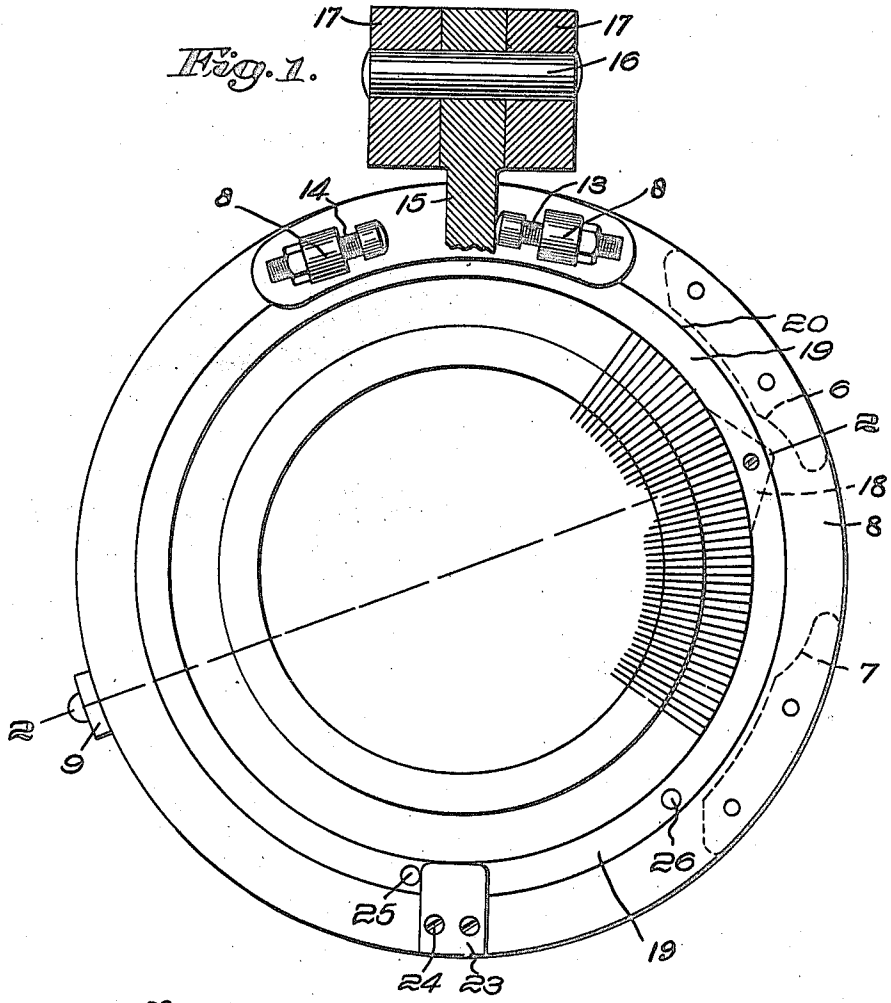
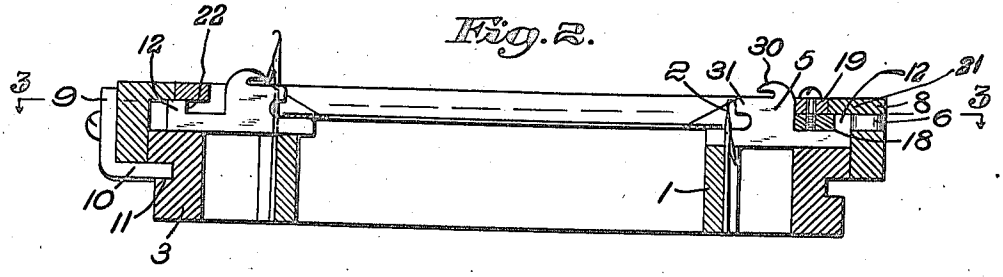


Fig. 2.



Inventor:
Augustin Gagné,
by Emery, Booth, Janney & Varney
Attys.

June 5, 1923. 1,457,903

A. GAGNÉ

WEB HOLDER CAM FOR KNITTING MACHINES

Filed May 7, 1920 2 Sheets-Sheet 2

Fig. 3.

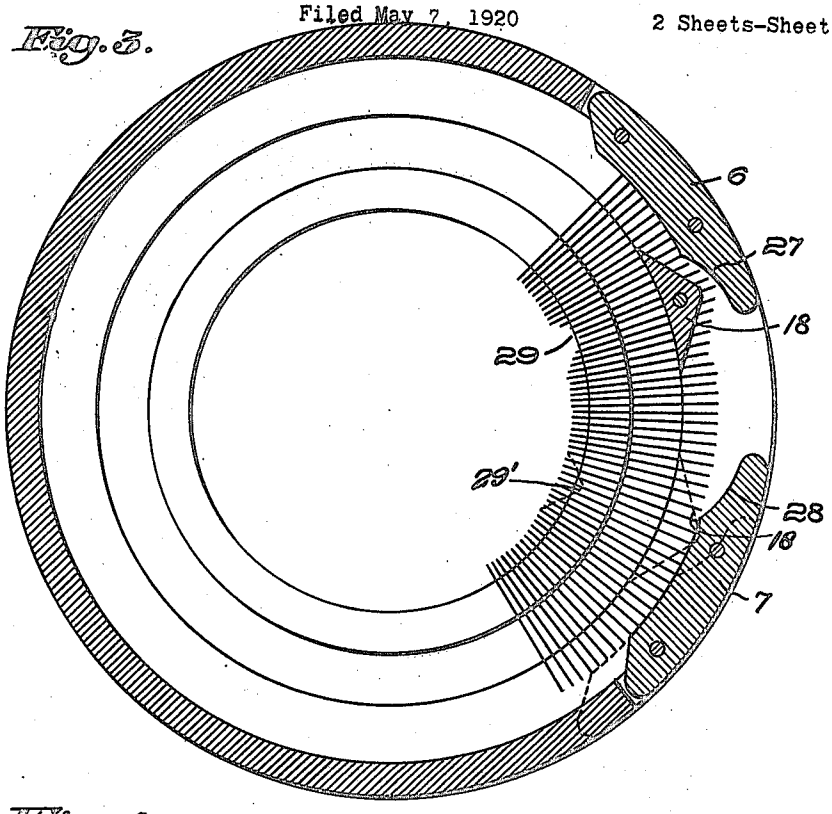
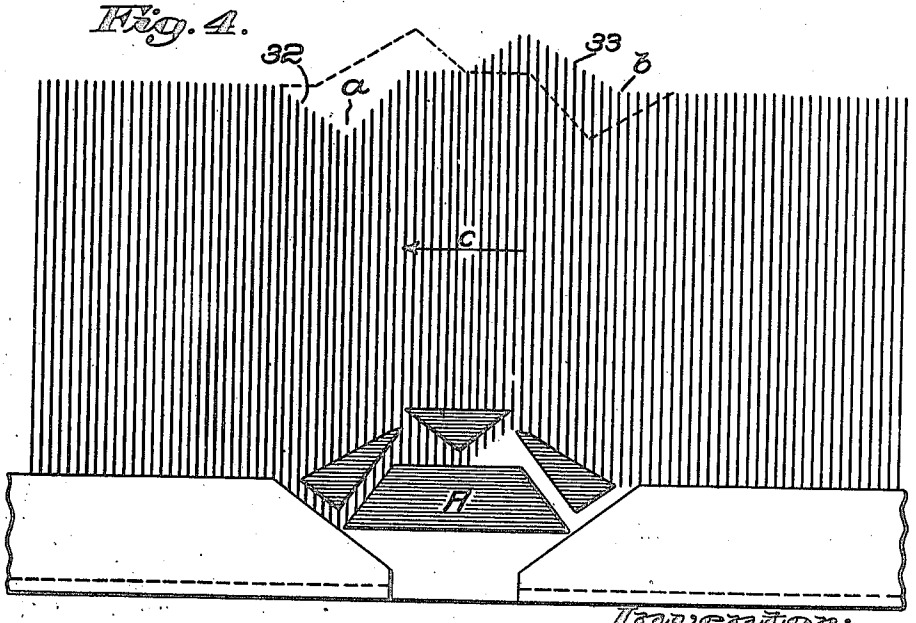


Fig. 4.



Inventor:
Augustin Gagné,
by Emery, Booth, Janney & Varney
Attys.

Patented June 5, 1923. 1,457,903

UNITED STATES PATENT OFFICE.

AUGUSTIN GAGNÉ, OF CENTRAL FALLS, RHODE ISLAND.

WEB HOLDER CAM FOR KNITTING MACHINES.

Application filed May 7, 1920. Serial No. 379,487.

To all whom it may concern:

Be it known that I, AUGUSTIN GAGNÉ, a citizen of the United States, and a resident of Central Falls, in the county of Providence and State of Rhode Island, have invented an Improvement in Web-Holder Cams for Knitting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to knitting machines and more particularly, though not exclusively, to latch needle machines of the general type disclosed in the patent to Hemphill No. 933,443, patented September 7, 1909.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims.

In the accompanying drawings I have shown merely for illustrative purposes a knitting organization embodying this invention wherein:

Fig. 1 is a plan view of the knitting head of the machine with certain parts removed to more clearly illustrate the features of the invention;

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1;

Fig. 3 is a section taken substantially on the line 3—3 of Fig. 2 and illustrates the sinkers or web holders, the sinker advancing cams and the sinker retracting cam, all occupying their proper positions for circular knitting;

Fig. 4 is a development of the needles and knitting cams, the latter operating upon the needle so as to produce the usual knitting wave.

In the drawings 1 represents the needle cylinder having the usual needle grooves formed in its periphery and within which are mounted needles 2. Supported upon said needle cylinder is a web holder or sinker ring 3 provided with the usual radial grooves 4 formed in its upper surface to contain or properly guide the sinkers or web holders 5, said web holders being herein shown as embodying the features of the web holders disclosed in the Hemphill Patent No. 933,443 patented September 7, 1909. It is, however, distinctly to be understood that the terms "web holders" and "sinkers" as herein used are interchangeable and are not to be considered as in any sense limiting the invention to the use of instruments capable merely of holding the web from being elevated during the knitting operation nor to the type of instruments intended solely for the purpose of sinking the yarn between the needles although the so-called web holders are more vitally concerned in the present application than are the sinkers, so-called.

The web holder ring 3 is secured directly to the needle carrier or cylinder 1 in the present example so as to revolve with said cylinder, thus maintaining the web holders 5 in proper alignment with the needles 2. The web holders may be and herein are advanced by the usual opposed advancing cams 6 and 7 arranged to function said web holders during the oscillatory movements of said web holder carrier in reciprocating knitting, the cam 6 being preferably the advancing cam for functioning said web holders during rotary knitting. It is often desirable to effect a shogging movement of said cams 6 and 7 and hence the usual web holder cam ring 8 is arranged to set down over the rim of the ring 3 in rotatable relation therewith whereon it is maintained by suitable clamping devices such as angles 9, one arm of which is secured to the outer rim of the cam ring 8 while the other arm 10 travels in a suitable peripheral groove 11 formed in said ring 3.

The cams 6 and 7 are mounted upon the ring 8 so as to engage the outer sides of the web holder butts 12 and at certain times in the operation of the machine to advance the web holders to the web holding positions shown in Fig. 3.

The ring 8 is arranged normally to remain substantially stationary during the operations of the needle cylinder and this by means such as stop-screws 13 and 14 adapted to engage opposite sides of the shank 15 herein of the latch ring 16, only a portion of which is illustrated in the drawings, said latch ring being pivotally mounted between ears 17, 17 of a suitable stand such as is common to the construction embodied in the Hemphill Patent No. 933,443. Ordinarily the adjusting members 13 and 14 are arranged far enough apart to allow a limited shogging or oscillatory movement of the ring 8 during reciprocating knitting and for the purpose of properly aligning the advancing cams 6 and 7 with the knitting

cams A (see Fig. 4) and also with the yarn feeding devices.

Heretofore it has been customary to mount the retracting cam or cams for said web holders upon the same ring that supports and carries the advancing cams 6 and 7 but in the present example a single retracting cam 18 has been provided to cooperate alternately with the cams 6 and 7 during reciprocating knitting, said cam 18 being preferably short so as to provide a very short knitting wave in the web holders whereby the number of loops or sinker wales that are unrestrained during the raising of the needles following the casting off of the loops will be very small and in consequence the web will not be allowed to work up on the needles. To enable the cam 18 to move independently of the advancing cams said cam 18 is mounted upon an independent ring 19 herein designated as an inner ring as distanguished from the outer ring 8. The ring 19 is arranged to substantially fit the inner periphery 20 of said outer ring and is thereby properly positioned centrally of the knitting head. Said inner ring 19 constitutes a continuation, as it were, of the upper web holder overlying portion 21 of said outer ring 8.

The outer edge of the inner ring 19 is annularly recessed at 22 to receive the upper ends of the butts 12 of said web holders and to engage the inner edges of said butts, said butt engaging surface constituting means for maintaining said butts in their proper inactive positions when not engaged by the retracting cam 18, said latter cam being inserted within a suitable recess formed in the under side of said inner ring in alignment with the portion of said ring which engages the inner edges of said butts 12. The shogging movement of the outer ring 8 is produced by friction between the web holder butts 12 and the cams 6 and 7 during alternate movements of the needle carrier and web holders, such movements being limited, as previously described, by the stops 13 and 14. The cam 18 is also subjected to a similar shogging action due to the friction between the butts of said holders and said cam during alternate movements of the web holders and in order to prevent an overthrow of said cam during such alternate movements means are provided for limiting relative movement between said inner ring and said outer ring, said means herein consisting of a plate 23 attached by screws 24 preferably to the outer ring 8 and projecting over said inner ring 19 into the paths of suitable stop members such as screws 25 and 26 disposed upon opposite sides of said plate 23 and adapted automatically to stop said cam 18 in operative relation to the advancing cams 6 and 7. The inner ring 19 depends for its support in part upon the upper surface of the ring 3 and in part upon the portions of the web holders in front of the butts 12 thus providing a smooth bearing surface upon which said ring is adapted to oscillate. The ring 19 is indirectly supported by the ring 3 since it rests upon the web holders, and these in turn rest upon the ring 3. Within this position said ring may be and in the present example is maintained by the plate 23.

From the foregoing it will be obvious that the cam 18 from time to time oscillates from a position cooperating with the inclined surface 27 of the cam 6 to a position where it will cooperate with the inclined surface 28 of the cam 7 and while in either of said positions a knitting wave similar to the wave 29 in Fig. 3 will be produced whereby the upper nib 30 of the web holder will be withdrawn from between the needles 2 during the casting off of the old loop from the said needles and the measuring of the yarn over the lower nibs 31 of said web holders prior to the formation of the new loop by the knitting instruments. With this arrangement of cams for operating said web holders the period of time in which the web will be unengaged or unrestrained by the upper nib of the web holders will be very short and will take place at only two points in the knitting waves produced by the series of needles, which points coincide with the loop shedding stages of knitting indicated at *a* and *b* in full and dotted lines respectively in Fig. 4, said points also being indicated in Fig. 3 at 29 in full lines and at 29′ in dotted lines, the positions of said cam 18 being also shown in full and dotted lines respectively in said figure.

As a result of the restricting of the knitting wave of said web holders as described the elevating and working up of the web upon the needles so common to knitting machines of the class described, will be entirely prevented because of the fact that the web holders are not retracted until immediately prior to the loop shedding and are then returned to their web holding positions immediately following said loop shedding instead of being retracted at one of said web holder advancing cams and in so remaining until the other advancing cam is passed thereby leaving said web unguarded or unrestrained during the upward trend of the needles at the incline 32 in Fig. 4. In other words the wave produced by the web holder cams will be localized at the casting off points.

It should be clearly and distinctly understood that the invention is not limited to use with the particular type of machine shown wherein the needle carrier is of cylindrical form and rotates and oscillates relatively to the knitting cams and sinker or web holder operating cams. It may also be

applied to machines in which the needle carrier or cylinder remains stationary and the knitting and web holder cams are revolved, and while certain constructions and arrangements of parts incidental to the present disclosure have been discussed in detail and certain specific terms have been employed in describing the same, yet it is to be understood that such are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims:

Claims.

1. In circular knitting mechanism employing circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including relatively circumferentially movable inner and outer curved members, together providing a groove for the reception of the entire series of said instrumentalities, and advancing and retracting cams carried by said curved members respectively to act upon said entire series of instrumentalities to advance and retract the same.

2. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including relatively circumferentially movable inner and outer circularly curved members together providing a groove for the reception of the entire series of said instrumentalities, and advancing and retracting cams respectively carried by said circularly curved members to act upon said entire series of instrumentalities to advance and retract the same.

3. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including relatively circumferentially movable inner and outer complete rings together providing a groove for the reception of the entire series of said instrumentalities, and advancing and retracting cams respectively carried by said rings to act upon said entire series of instrumentalities to advance and retract the same.

4. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including relatively circumferentially movable inner and outward curved members together providing a groove for the reception of the entire series of said instrumentalities, a retracting cam carried by one of said curved members, and advancing cam means carried by the other curved member, thereby to act upon said entire series of instrumentalities to advance and retract the same.

5. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including relatively circumferentially movable, inner and outer, complete rings, together providing a groove for the reception of the entire series of said instrumentalities, a retracting cam carried by one of said complete rings, and advancing cam means carried by the other complete ring, thereby to act upon said entire series of instrumentalities to advance and retract the same.

6. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including relatively circumferentially movable inner and outer rings together providing a groove for the reception of the entire series of said instrumentalities, a retracting cam carried by one of said rings, and a pair of advancing cams carried by the other ring at opposite sides of said retracting cam, said cams acting upon the said entire series of instrumentalities to advance and retract the same.

7. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including relatively circumferentially movable inner and outer curved members together providing a groove for the reception of the entire series of said instrumentalities, said inner member having a retracting cam, and said outer member having advancing cam means, thereby to act upon said entire series of instrumentalities to advance and retract the same.

8. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including relatively circumferentially movable inner and outer rings together providing a groove for the reception of the entire series of said instrumentalities, said inner

ring having a retracting cam and said outer ring having advancing cam means, thereby to act upon said entire series of instrumentalities to advance and retract the same.

9. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including an inner curved member having a retracting cam for all of said instrumentalities, and also including an outer curved member having a pair of advancing cams for all said instrumentalities, said curved members having relative circumferential movement.

10. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including inner and outer rings together providing a groove for the reception of the entire series of said instrumentalities, and advancing and retracting cam means respectively carried by said rings to act upon said entire series of instrumentalities to advance and retract the same, both of said rings being circumferentially movable.

11. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including inner and outer rings together providing a groove for the reception of the entire series of said instrumentalities, and advancing and retracting cam means respectively carried by said rings to act upon said entire series of instrumentalities to advance and retract the same, said rings being relatively circumferentially movable, and limiting means to limit said relative circumferential movement.

12. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including inner and outer rings together providing a groove for the reception of the entire series of said instrumentalities, and advancing and retracting cams respectively carried by said rings to act upon said entire series of instrumentalities to advance and retract the same, each of said rings having capacity for shogging movement independently of the other.

13. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities, a needle cylinder and a bed ring secured to the upper end of said needle cylinder and receiving said instrumentalities, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including relatively circumferentially movable inner and outer rings together providing a groove for the reception of the entire series of said instrumentalities, and advancing and retracting cams carried by said rings to act upon said entire series of instrumentalities to advance and retract the same.

14. In circular knitting mechanism employing a circular series of sinkers, web holders or like instrumentalities and a bed ring receiving the same, a cap ring-like part for said instrumentalities adapted to overlie the latter and said bed ring, said cap ring-like part including two cam rings 8, 19 having interengaging formations 23, 25, 26 permitting lost motion between said rings, a retracting cam 18 carried by the inner ring and two advancing cams 6, 7 carried by the outer ring, whereby all of said instrumentalities are acted upon by said cams.

In testimony whereof, I have signed my name to this specification.

AUGUSTIN GAGNÉ.