

Sept. 20, 1960

H. SCHÜRICH ET AL

2,953,005

ACTUATOR OF A HAND KNITTING APPARATUS

Original Filed April 30, 1956

Fig. 1

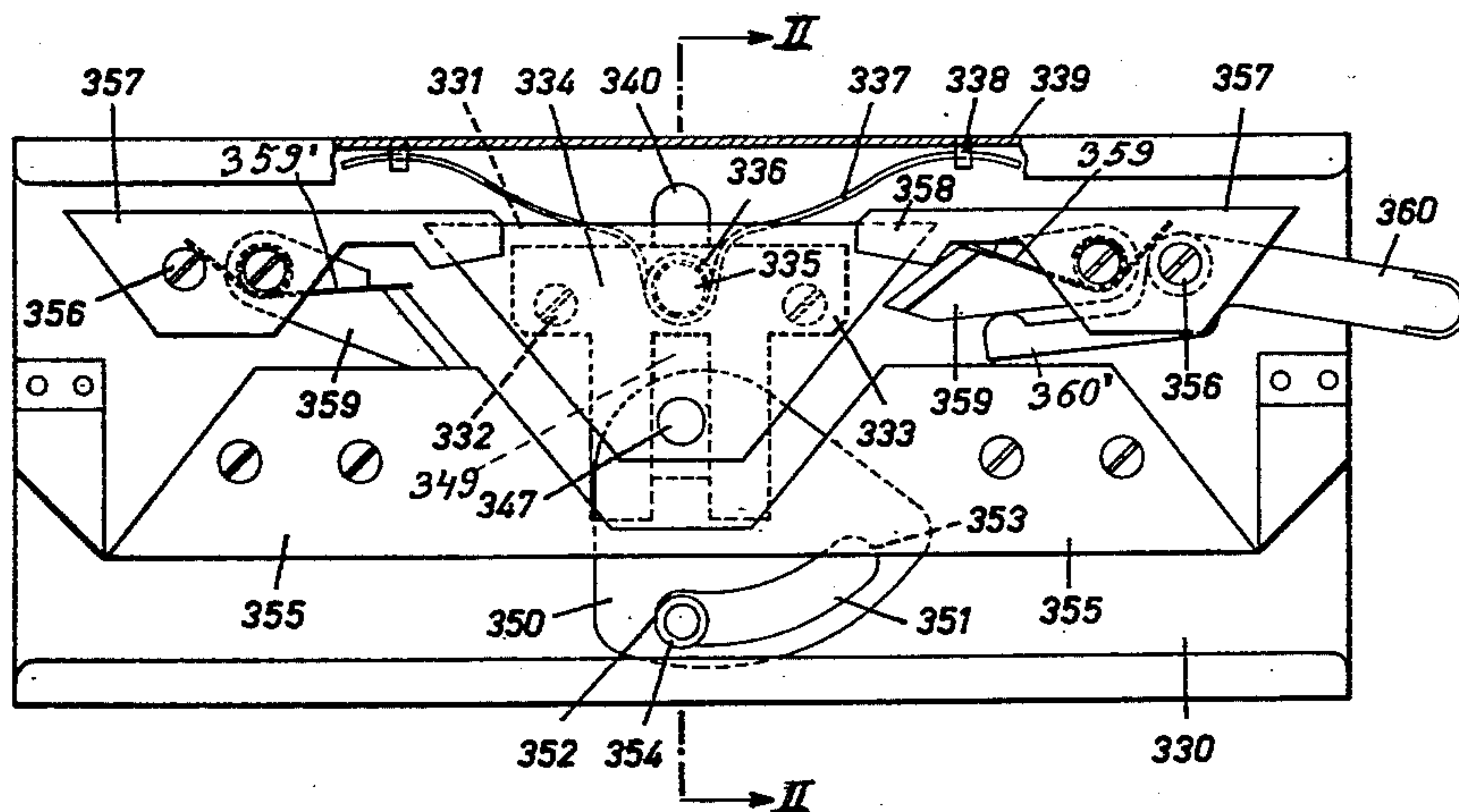


Fig. 2

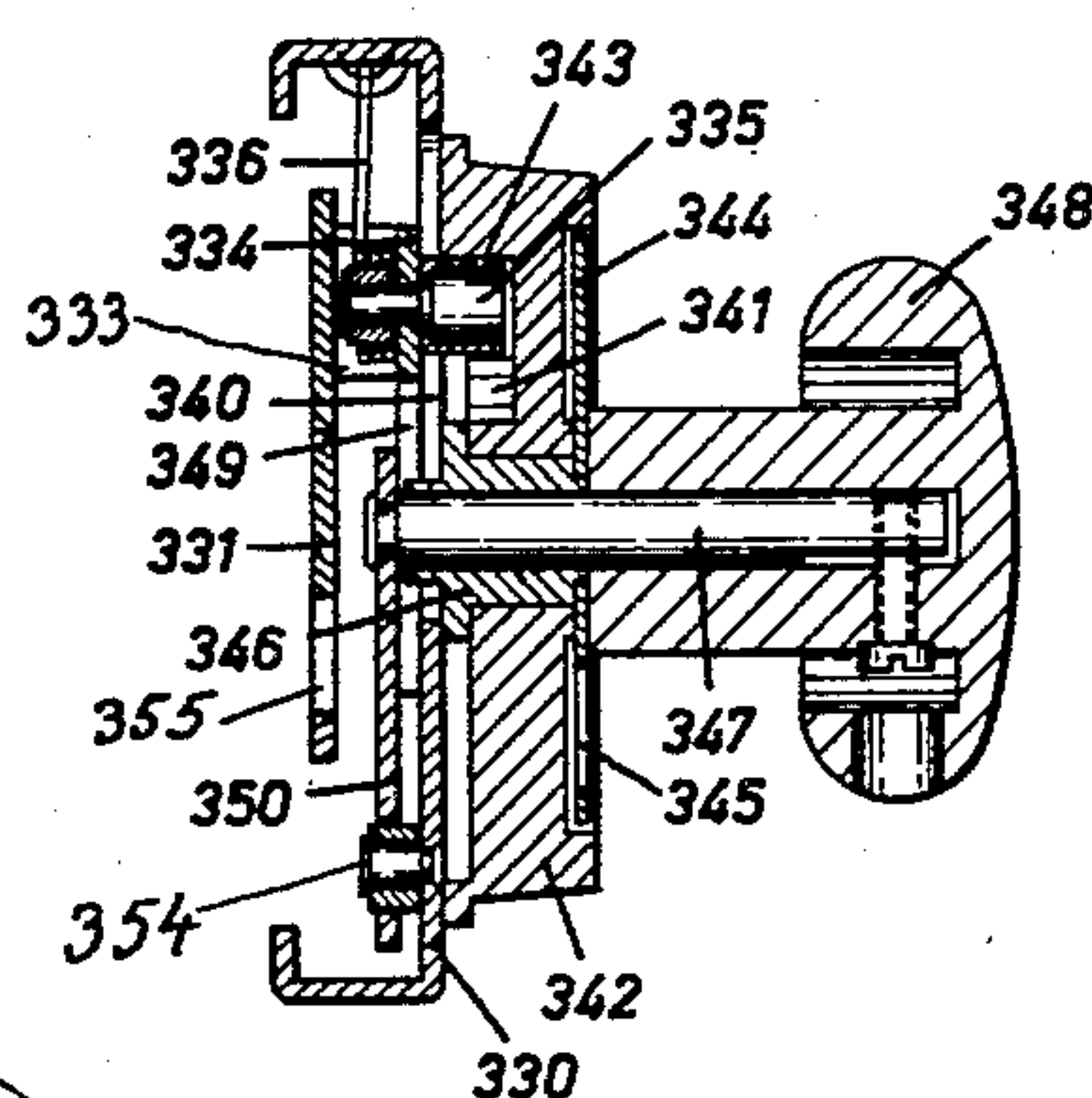
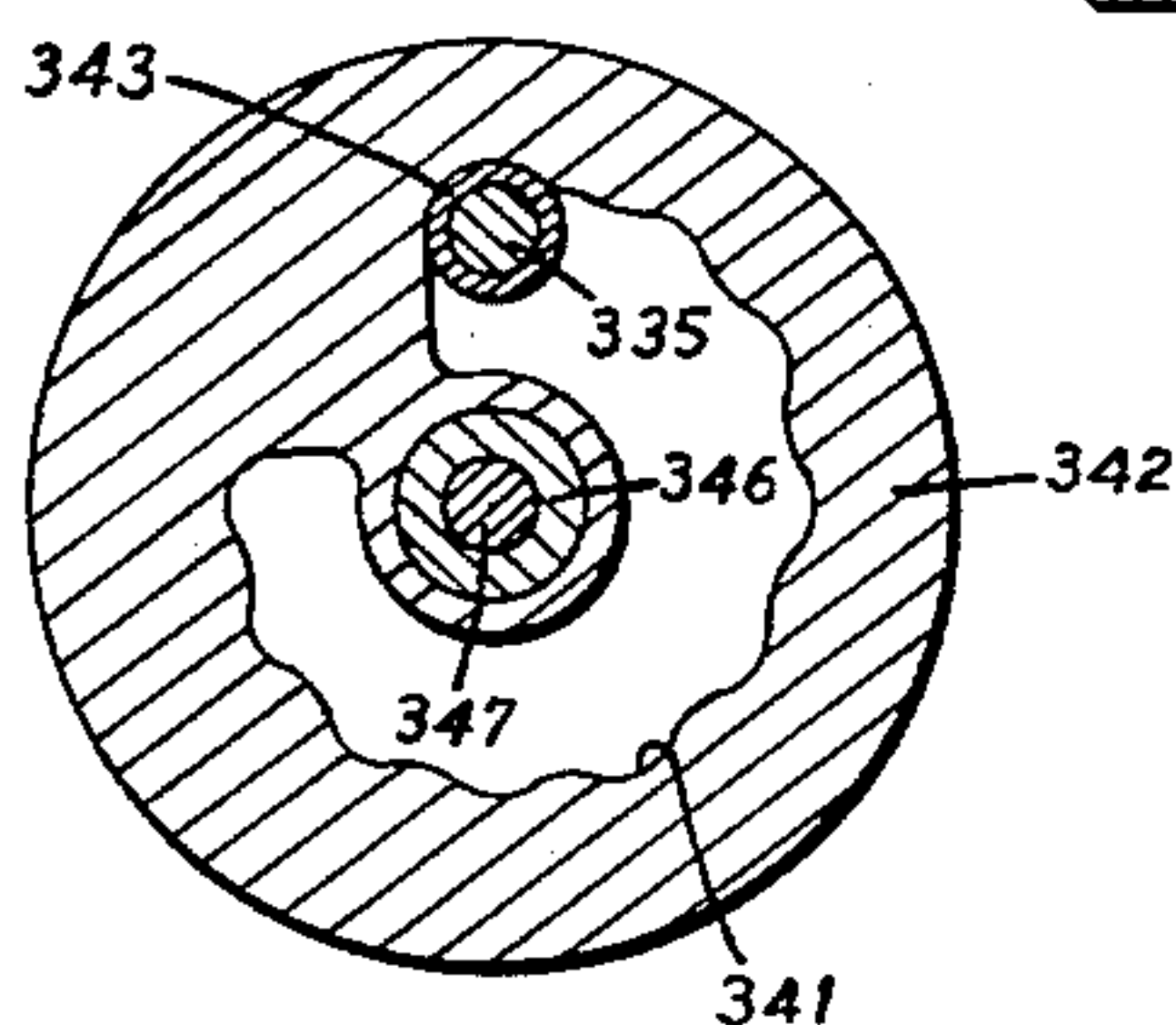


Fig. 3



INVENTORS

*H. Schürich*  
*O. Bunge*

*By Glasgow Downing Tebbold*

ATTYS



1

2,953,005

## ACTUATOR OF A HAND KNITTING APPARATUS

Herbert Schürich, Mudrackzeile 1, Berlin-Reinickendorf,  
and Otto Bunge, Bonhoeffer Ufer 17, Berlin-Charlotten-  
burg, Germany

Original application Apr. 30, 1956, Ser. No. 581,686, now  
Patent No. 2,904,978, dated Sept. 22, 1959. Divided  
and this application Apr. 22, 1958, Ser. No. 730,190

Claims priority, application Germany May 5, 1955

6 Claims. (Cl. 66—78)

The present invention relates to hand knitting apparatus and this application is a division of our co-pending application, Serial No. 581,686, filed April 30, 1956, now Patent No. 2,904,978.

Additional devices are often used on hand knitting apparatus, particularly for the production of right/left patterns, and these devices comprise an auxiliary needle bed with an auxiliary actuator movably supported above such bed. Hence, the invention consists in an actuator for the additional device, designated an auxiliary actuator, constructed in its individual components in a particular manner as compared to the actuator of the knitting apparatus per se, the so-called main actuator.

According to the invention, the auxiliary actuator is similar to the actuator of the main needle bed in its essential elements. Thus, this actuator is provided at either side of a central needle sinker with a needle lifter, each of which is stationary, an auxiliary needle above each of the same, and a spring operated latch between each sinker and needle lifter. The needle sinker is supported for upward and downward adjustable movement, by means of a spiral curve having individual catches and a rotary button to adjust the mesh density.

The primary deviation of the auxiliary actuator from the main actuator is that the needle sinker, apart from the catch adjustment by means of the spiral curve, is given by a swinging plate, an additional movement over a further button, by means of which the plate is pivoted.

Furthermore, one of the two latches may be pivoted by means of a lever into a position in which the same is ineffective relative to the needle butts. In this manner, it is possible to produce catch patterns in using the auxiliary actuator.

In a special embodiment of the invention, the shaft of the spiral curve rotary button is secured at one end to the plate, passes centrally of the button and carries a rotary handle at the end projecting from the actuator plate. The sector-like plate is provided adjacent the outer circumference with an arcuate slot which is engaged by a pin rigidly secured to the actuator plate. The slot is arranged in the sector-like plate so that upon the plate being pivoted by means of the turning button, the slot slides along the stationary pin and thereby displaces the shaft of the rotary button transversely to the longitudinal direction of the actuator plate, thus simultaneously displacing also upwardly the rotary disc and the needle sinker so that the passing needles are less deeply retracted into the needle bed during the movement of the actuator. As will later be more fully described, this causes a minor tensioning effect during the return travel of the auxiliary actuator on the thread already laid in loops.

From a study of the following description and drawing, various other objects and advantages of the invention will become more readily apparent to a person skilled in the art.

In order to understand the invention, reference will

2

be had to the accompanying drawing illustrating a preferred form thereof, and, in which:

Fig. 1 is a bottom view of the auxiliary actuator of the present invention, and,

Fig. 2 is a cross-sectional view taken along the line II—II of Fig. 1, the view looking in the direction of the arrows.

Fig. 3 is a cross-sectional view taken along the line III—III of Fig. 2, the view looking in the direction of the arrows.

As shown in the drawings, a needle sinker 331 is provided on actuator plate 330 of the auxiliary actuator. The needle sinker is secured by means of two screws 332 to downwardly bent flaps 333 arranged at either side of a sinker slide 334. At its upper portion, the sinker slide 334 carries a pin 335 and the end of the pin extending into the interior of the actuator plate carries a coil spring 336 having two ends 337 extending substantial distances to the sides. The spring ends 337 are inserted in eye-like elements 338 at side wall 339 of the actuator plate 330. The end of the pin 335 projecting upwardly through a transverse slot 340 of the actuator plate engages recess 341 of a setting disc 342. The outer circumference of the recess 341 is formed as a spiral curve 343 which is provided with individual catches into which the pin 335 is urged by the spring 336. Setting numerals 1 to 10 are applied to the outer face of the setting disc 342 with a disc 344 covering the numerals and merely showing the respective setting numeral through a circular opening 345. The covering disc 344 is secured against rotation and supported on a sleeve 346 which is guided within the slot 340 of the actuator plate and is secured against rotation.

A shaft 347 is rotatably supported within the sleeve 346 and carries at its outer end, a setting button 348 which is connected to the shaft and fixed against rotation by a screw. The inwardly projecting end of the shaft 347 passes through the slot 340 of the actuator plate and through a slot 349 of similar configuration in the slide 334 and is securely riveted to plate 350.

The plate 350 is provided with an arcuate slot 351 which is so arranged that the distance of the center line of the slot from the shaft 347 gradually increases from one end 352 to the other end 353 and a pin 354 secured to the actuator plate engages the slot 351.

On the actuator plate, at either side of the needle sinker 331, there is secured one needle lifter 355, with the same being connected by a web. One auxiliary needle sinker 357 is arranged above each lifter 355 and each auxiliary sinker is mounted on bolt 356. Each sinker 357 is provided with an inwardly extending safety deflecting projection 358 of which each one as shown in Fig. 1 engages under the lateral points of the needle sinker. Since both sinker and needle sinker must lie in about the same parallel plane as the plate, an engagement of the deflecting projections 358 with the points of needle sinker 331 can only be achieved in that either the points of the needle sinker or the projections 358 are released in steps within the area of engagement in such a manner that a certain space is present at these points of engagement between the two elements facing each other. This is important also because needle sinker 351 is adjusted upwards and downwards. On the inner bolt 356 of each auxiliary needle sinker is supported a spring operated latch 359 and the right hand latch 359 may be rendered inoperative by the upward swinging movement of a flat disengaging lever 360. The lever 360 is pivotally supported by the outer bolt 356 of the right-hand sinker 357 and is slightly offset in its surface so that the same can be pivoted after assembly only in overcoming friction, the force of which is in excess of the spring force of the latch.



3

The purpose of the above described arrangement is to allow the knitting of catch or double-catch patterns. To obtain such ends, selectively one latch each of the main or auxiliary actuator, or both of the same are rendered inoperative. In the operation of the respective actuator, the needles are not moved to their highest position in their upward travel, but merely to the inserting position. Consequently, the meshes formed by the needles do not get behind the tongues of the needles, but remain lying thereon. During the next actuator travel in the opposite direction, the needles therefore do not form new meshes, but merely form loops. The meshes of the preceding row and the newly formed loops now get behind the tongues on this stroke because only one latch may be rendered inoperative on each actuator. In knitting catch patterns, a certain succession of operations results for the actuators to be independently moved. It is necessary then to render the needle sinker inoperative during a certain inoperative stroke of the auxiliary actuator since otherwise the loops formed by the main actuator would be torn and this is attained by turning the sector-like plate.

While the invention has been illustrated and described with respect to the aforementioned embodiment, it is not intended to be limited to the details shown since various modifications and structural changes may be made without departing in any way from the spirit and scope of the invention as set forth in the appended claims.

We claim:

1. An actuator for additional devices on a hand knitting apparatus including an actuator plate, a central needle sinker on the plate, a stationary needle lifter arranged at each side of the central needle sinker, an auxiliary needle sinker on the plate above each stationary needle lifter, a latch arranged between each auxiliary needle sinker and each stationary needle lifter, pin means on which each latch is pivotable and resiliently supported, and means for adjustably supporting the needle sinker upwardly and downwardly, said means comprising two pivotable, mutually bearing elements, each element having a spiral curve, and a catch operably coupled with each spiral curve whereby one catch is operably associated with the needle sinker and the other catch with the plate.

4

2. An actuator as claimed in claim 1 in which one of said pivotable elements includes a swinging plate having a slot therein defining the spiral curve, a rotary button, catch means passing through a bore in the other pivotable element connecting the button to the swinging plate whereby the actuator plate is located at the side of the needle sinker turned toward the pivotable elements, the actuator plate engaging the catch means by slot means in the first named pivotable element and the other catch being secured to the plate.

3. An actuator as claimed in claim 2 wherein said rotary button includes a shaft to one end of which the plate is secured with the shaft extending centrally of the button and an operating head on the free end of the shaft projecting from the actuator plate.

4. An actuator as claimed in claim 3 wherein said plate is of sector-like outline and is provided adjacent the outer circumference with an arcuate slot defining the spiral curve engaged by a pin rigidly secured to the actuator plate, the position of the arcuate slot being such that on swinging the plate by turning the head, the slot slides along the pin so that the axis of the rotary button is displaced transversely to the longitudinal direction of the actuator plate thus simultaneously adjusting the needle sinker.

5. An actuator as claimed in claim 1 further including a lever pivotally connected to one of said auxiliary needle sinkers whereby the latch associated with said sinker can be pivoted to the inoperative position in which the latch is ineffective respecting the needle butts.

6. An actuator as claimed in claim 1 wherein the needle sinker is arranged at downwardly offset flaps formed at each side of a sinker slide carrying at its upper end a pin, one end of the pin supporting a coil spring, the ends of the coil spring extending materially to the sides and being inserted in eyes carried by the side wall of the actuator plate and the other end of the pin extending through a transverse slot in the actuator plate and engaging a recess in the component having the spiral curve.

#### References Cited in the file of this patent

#### UNITED STATES PATENTS

2,759,343 Schurich Aug. 21, 1956