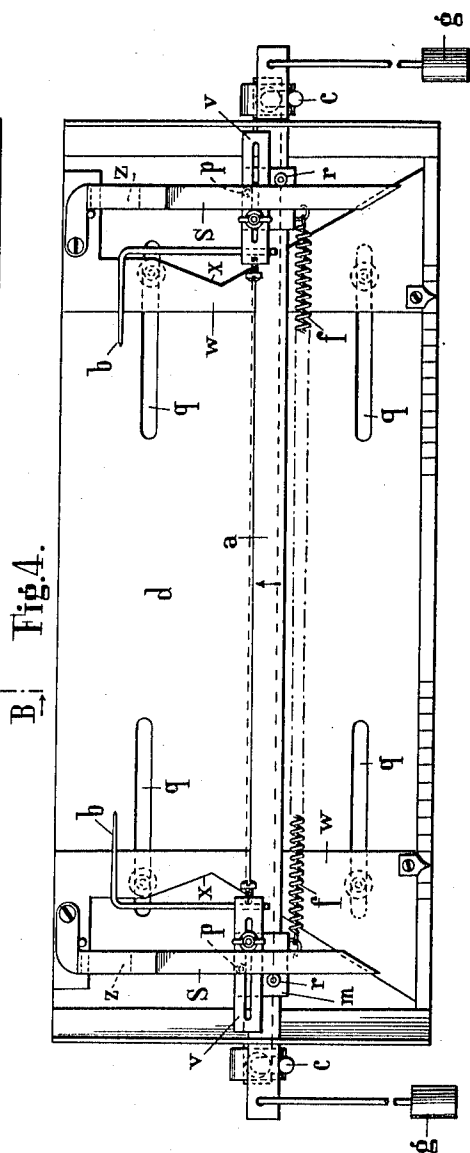
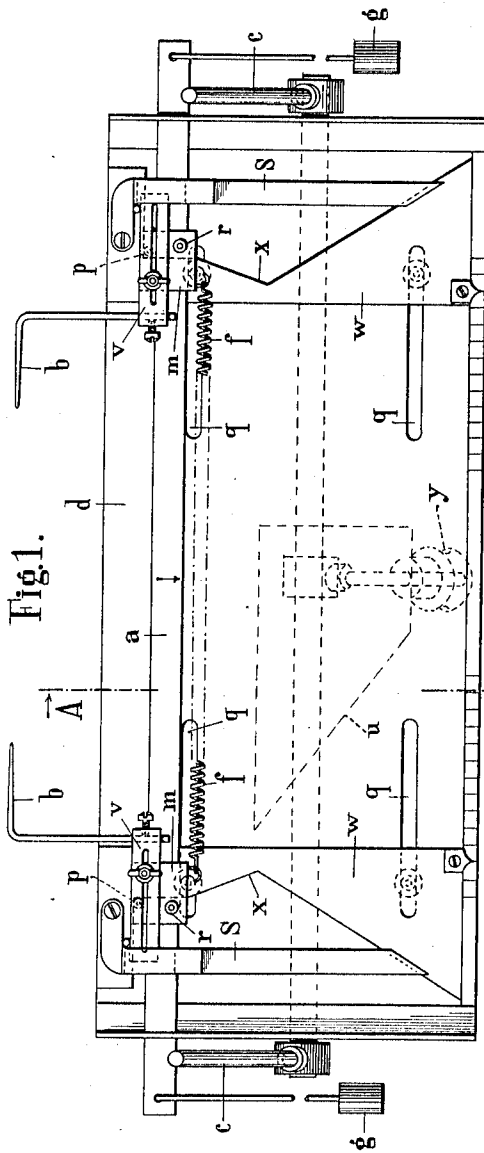


C. GOEBEL.
 AUTOMATIC TAKE-UP DEVICE FOR FLAT KNITTING MACHINES.
 APPLICATION FILED JULY 6, 1911.

1,022,233.

Patented Apr. 2, 1912.

3 SHEETS-SHEET 1.



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Fig. 2.

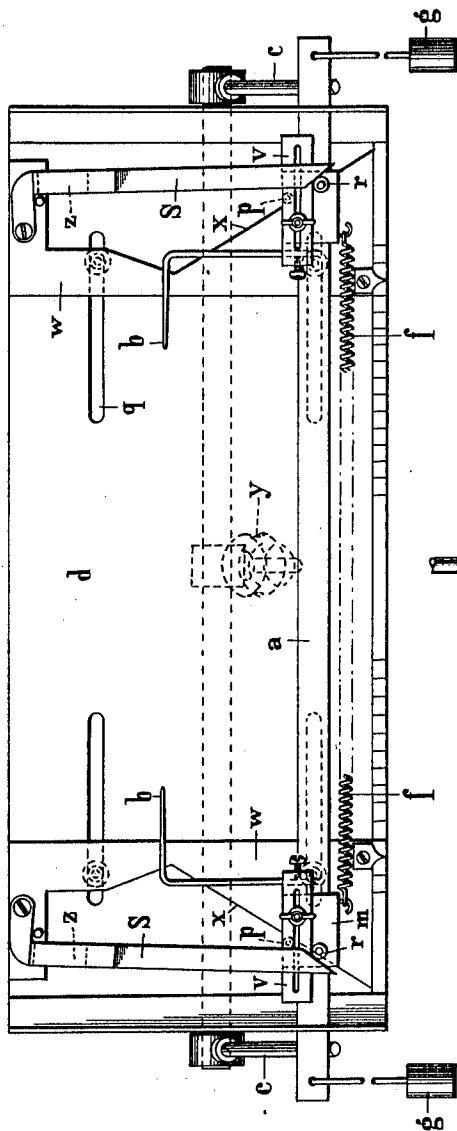
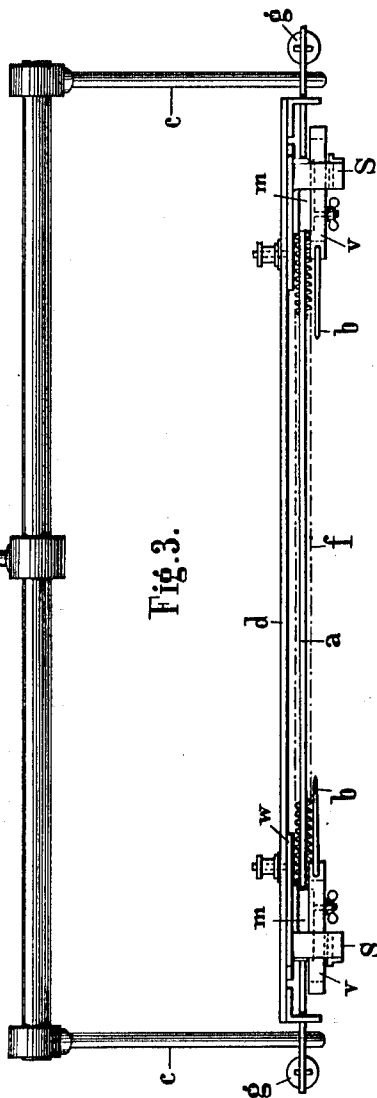


Fig. 3.



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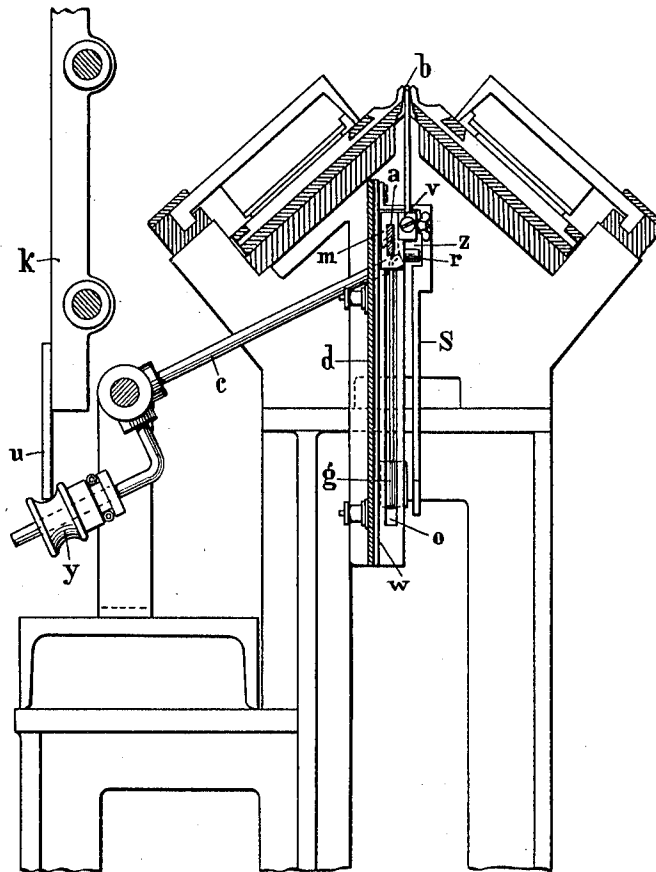
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Fig. 5.



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 his Attorney

UNITED STATES PATENT OFFICE.

CARL GOEBEL, OF MÜLHAUSEN, GERMANY, ASSIGNOR TO CLASS & FLENTJE GESELLSCHAFT MIT BESCHRÄNKTER HAFTUNG, OF MÜLHAUSEN, GERMANY, A CORPORATION OF GERMANY.

AUTOMATIC TAKE-UP DEVICE FOR FLAT-KNITTING MACHINES.

1,022,233.

Specification of Letters Patent.

Patented Apr. 2, 1912.

Application filed July 6, 1911. Serial No. 637,071.

To all whom it may concern:

Be it known that I, CARL GOEBEL, engineer, a subject of the German Emperor, and resident of Mülhausen, Thuringia, Germany, have invented a new and useful Automatic Take-Up Device for Flat-Knitting Machines, of which the following is a specification.

Mechanical devices, in which the draw-off hooks of knitting machines are brought into engagement, by automatic oscillation or rotation are well known. This invention has the advantage over such devices that the take-up hooks are capable of parallel displacement and are so arranged that they cannot foul the rising needles or the guards over the knock-off combs, etc. Moreover the take-up hooks which are always moved uniformly in a parallel manner, can be adjusted independently of each other to suit different widths of fabric and are interchangeable, the members carrying the hooks being so arranged that in multiple-unit machines the whole of the knock-off devices can be simultaneously controlled by means of a common bar, while they can be simultaneously driven at both sides of the frame by one and the same driving gear. The adjustment of the take-up hooks by means of the positioning members is exceedingly simple, and can be easily effected without taking apart. The release of the hooks from the fabric is effected in a gradual, progressive manner, in accordance with the progress of the working operation, so that a more uniform fabric is produced. The weight of the take-up hooks can be calculated or modified as required. The driving is effected periodically for both sides by means of a single mechanism, but in such manner that if desired the release could be effected at any moment by hand, for instance when owing to dropped stitches or to a breakage of the thread, a portion of the fabric has dropped off the needles.

A construction according to this invention is illustrated, by way of example, in the accompanying drawings, in which:

Figure 1 shows the take-up device in front elevation, the hooks being shown in the position in which they are in engagement with the stitches or with the course. Fig. 2 is a corresponding view showing how

the take-up hooks with their bearing brackets pass under the switches or points and are withdrawn from the fabric. Fig. 3 is a plan view of Fig. 2. Fig. 4 is a front elevation corresponding to the view shown in Fig. 1, with the central portion broken away, and shows how the take-off hooks sliding outside along the switch are again raised. Fig. 5 is a section on the line A—B, Fig. 1, showing the take-up device arranged on a knitting machine, the driving gear for raising the hooks being shown diagrammatically.

The take-up hooks *b* are mounted in a vertically and horizontally adjustable manner on sliding bars or supports, *m* which are movable on a bar *a*. The bar *a* itself is in its turn adjustable in the frame or plate *d*, which has narrow lateral walls or flanges, in the slots *o* of which the bar *a* is guided. The latter is suitably weighted, say at its ends, with interchangeable weights *g* (Figs. 1 and 2) which automatically draw off the fabric after the engagement of the hooks, as the operation progresses. The bar is then raised by means of levers *c* engaging preferably at both sides under the bar and driven by a single mechanism. During the up and down movement of the bar *a*, the take-up hooks with their sliding bars *m* make a movement of their own, sliding to and fro on the bar *a*, whereby the engagement with the fabric and the release are effected at the proper moments. To that end, there are adjustably secured to the plate *d* at both sides symmetrical guide plates *w* in such manner that according to the width of the fabric, they impart a desired reciprocation to the sliding bars of the take-up hooks, which are guided along their outer tracks *x*. During this movement the sliding bars are pressed by means of a common spring *f*, so that their pins *p* preferably provided with rollers, are pressed against the guide track *x* in such manner that they follow the outline of the said track, and during the first portion of the movement come nearer to each other for the purpose of entering the margin of the fabric or move apart, for the purpose of releasing the fabric and withdrawing the hooks. The guide track can of course be made or shaped to suit the form of the

fabric. In order to keep the hooks out of engagement with the fabric during the rising of the bar, bars or pawls *S* forming switches or points are pivoted to the plates *w* in such manner that suitably arranged pins *r*, preferably provided with rollers on the sliding bars *m*, can pass under the points after the release of the fabric, so that during the rising motion by the levers *c* they will slide along the outer side of the bars *S*. A slot *z* is provided in each bar *S* to enable the pins *r* and consequently the sliding bars *m* when in the highest position to move inward together under the action of the spring *f*, so as to return to the inner side of the bars *S*, the hooks *b* being at the same time moved in an exactly parallel manner and brought into engagement with the new knocking off stitches of the fabric for the next course. This process is repeated periodically and at determined intervals, in accordance with the adjustments of the adjustable parts and of the track of the guide plates *w*.

The driving gear for raising can be constructed in various ways, preferably in the manner shown in Fig. 1. In this case, the levers *c*, mounted on one and the same shaft, engage under the bar *a*. The shaft has a downwardly cranked arm (Fig. 5) preferably provided with a roller *v*, which engages under the inclined plane or track plate *u* which is reciprocated in a suitable manner by means of the driver box *k* of a slide or carriage. It will be seen that the roller, in riding up the inclined plane *u*, will effect a turning of the shaft and of the levers *c*, and thus the raising of the bar. The movement of the slide or the engagement of the roller at the proper moment can be periodically effected by means of a traveling chain or in some other suitable manner. It will be understood, however, that the movement could also be effected at any moment by hand.

When the plates *w* which are adjustable in slots *g*, in which they are clamped, are arranged on through bars, adjustment of the apparatus can be effected simultaneously for several tops.

The working of the take-up device will be readily understood from the preceding description. When the bar is raised and the take-up needles are brought into engagement, it will be released by the levers *c*, so that it hangs with its weights on the fabric. As the operation proceeds, it will pull down the fabric, the rollers *p* sliding along the track *x* of the guide plates *w*. In the construction shown in Fig. 1, there will therefore, at first be no movement of the take-up hooks. Then under the action of the spring *f* they will come nearer together with a progressing narrowing action, but when sliding along the bottom portion of the guide

track, they will again move away from each other and release the fabric. At the same time the freely hanging points *S* will be pushed aside by the rollers *r*, until the slides *m* have passed beyond the points, whereupon the latter will return to their normal positions. The movement of the levers *c*, will then begin, so that the bar will be raised, the rollers of the pins *r* passing up along the outer sides of the points, and thus keeping the take-up needles *b* out of engagement, until they reach the passage slots *z* in their highest position. The slides will then again approach each other under the influence of the spring *f*, the take-up hooks engaging over the new course. Owing to the parallel movement of the hooks, any contact with the moving needles will be prevented. This movement is periodically repeated in accordance with the shape of the fabric, and can be effected by suitable adjustment of the parts at desired intervals.

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

1. An automatic take up device for knitting machines comprising in combination a bar arranged transversely to the direction of delivery of the fabric, a take up hook slidably mounted thereon, automatic means for causing said hook to slide along said bar, and means for causing appropriate movements of the bar and sliding hook back and forth in the line of delivery, substantially as described.

2. An automatic take up device for knitting machines comprising in combination a bar arranged transversely to the direction of delivery of the fabric, take up hooks slidably mounted near opposite ends thereof, automatic means for causing said hooks to slide toward and away from each other along said bar, and means for causing appropriate movements of the bar and hooks back and forth in the line of delivery, substantially as described.

3. An automatic take up device for knitting machines comprising in combination a bar arranged transversely to the direction of delivery of the fabric, interchangeable take up hooks slidably and removably mounted near opposite ends of said bar, automatic means for causing said hooks to slide along said bar, and means for causing appropriate back and forth movements of said bar and hooks, substantially as described.

4. An automatic take up device for knitting machines comprising in combination a bar arranged transversely to the direction of delivery of the fabric, a support slidably mounted upon said bar, a take up hook adjustably mounted upon said support, automatic means for causing said hook to slide along said bar, and means for causing ap-

propriate back and forth movements of said bar and hook support, substantially as described.

5. An automatic take up device for knitting machines comprising in combination a bar arranged transversely to the direction of delivery of the fabric, means for causing back and forth movement of said bar in the line of delivery, a slidable support on said bar, a take up hook thereon, a guide track, means tending to press said slidable support toward said guide track during movement of the bar in one direction and automatic means for holding said support away from said guide track during opposite movement of the bar, substantially as described.

6. An automatic take up device for knitting machines comprising in combination a bar arranged transversely to the direction of delivery of the fabric, means for causing back and forth movement of said bar in the line of delivery, a slidable support on said bar, a take up hook thereon, a guide track, means tending to press said slidable support toward said guide track during movement of the bar in one direction and a swinging switch lever adapted to provide a track for holding said support away from said guide track during opposite movement of the bar, substantially as described.

7. An automatic take up device for knitting machines comprising in combination a bar arranged transversely to the direction of delivery of the fabric, take up hooks slidably mounted near opposite ends thereof, automatic means for causing said hooks to move in opposite directions both back and forth on said bar during a single movement of the bar in one direction, and means for causing appropriate back and forth movement of said bar and hooks in the line of delivery, substantially as described.

8. A device of the character described comprising in combination with appropriate means for taking away the fabric as it is produced, oppositely pointed take-up

hooks, means for causing simultaneous movement of said hooks while preserving the angular relation of each to the direction of delivery, and automatic means for causing said hooks to move toward and away from each other, substantially as described.

9. In a device of the character described, a transverse bar, a slidable support thereon, a take up hook on said support, a guide plate coöperating with said support to control its position on said bar, and means for causing said bar to move back and forth, substantially as described.

10. In a device of the character described, a transverse bar, a slidable support thereon, a take up hook on said support, an adjustably mounted guide plate coöperating with said support to control its position on said bar, and means for causing said bar to move back and forth, substantially as described.

11. In a device of the character described, a bar arranged across the line of feed of the fabric, slidable take up hooks thereon, weights on said bar, and tilting levers engaging the opposite ends of said bar for actuating the same, substantially as described.

12. In a device of the character described, a bar arranged across the line of delivery of the fabric, slidable take up hooks thereon, supports for said hooks, means for moving the bar back and forth, swinging switch bars in the path of movement of the hook supports, each having an opening to permit the hooks to move toward each other, and springs for drawing said hooks together, substantially as described.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 23d day of June 1911.

CARL GOEBEL.

Witnesses:

RUDOLF SCHULZ,
C. H. GOHRODCZ.