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MULTICOLOR WEFT REPLENISHING MEANS

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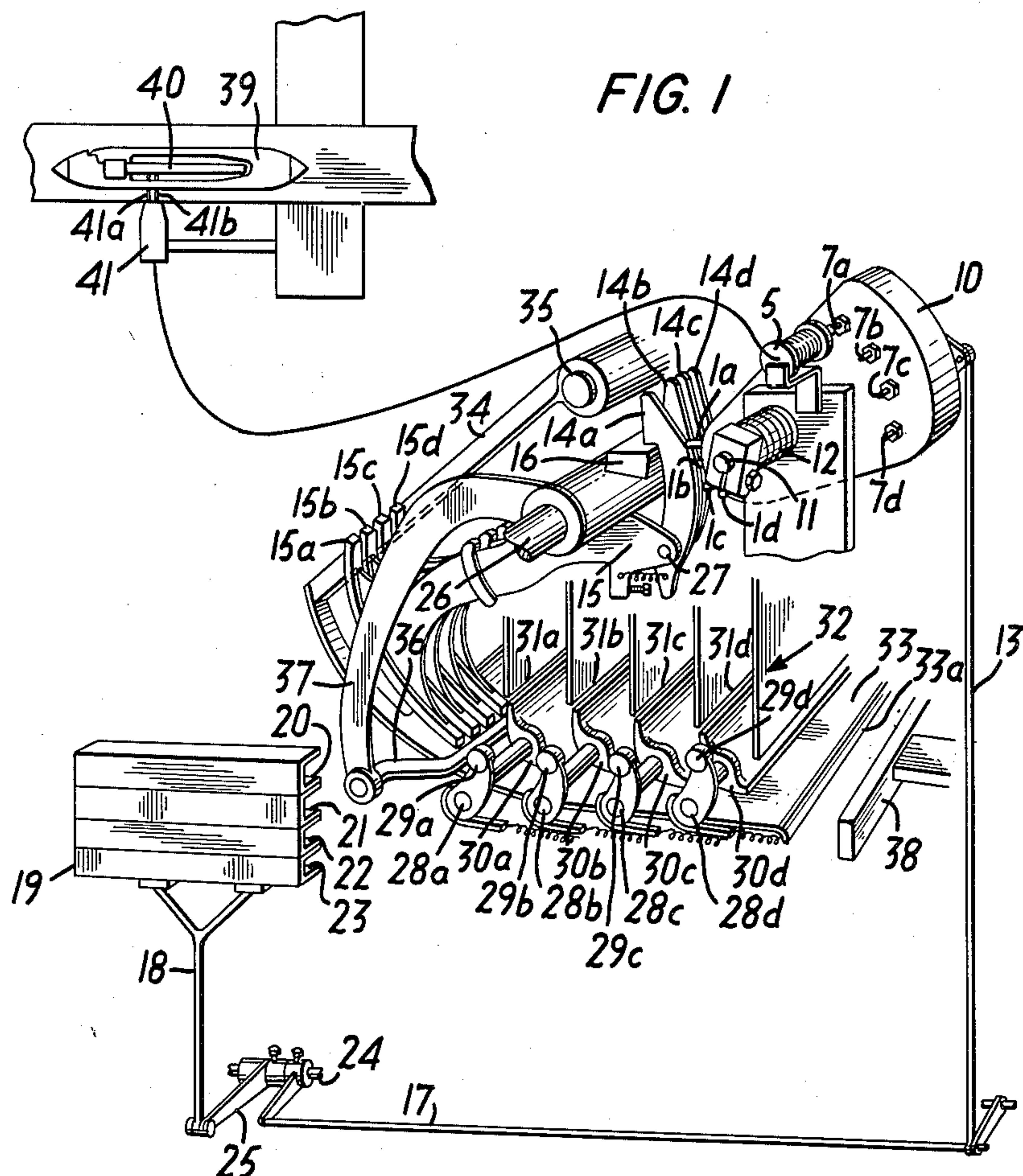
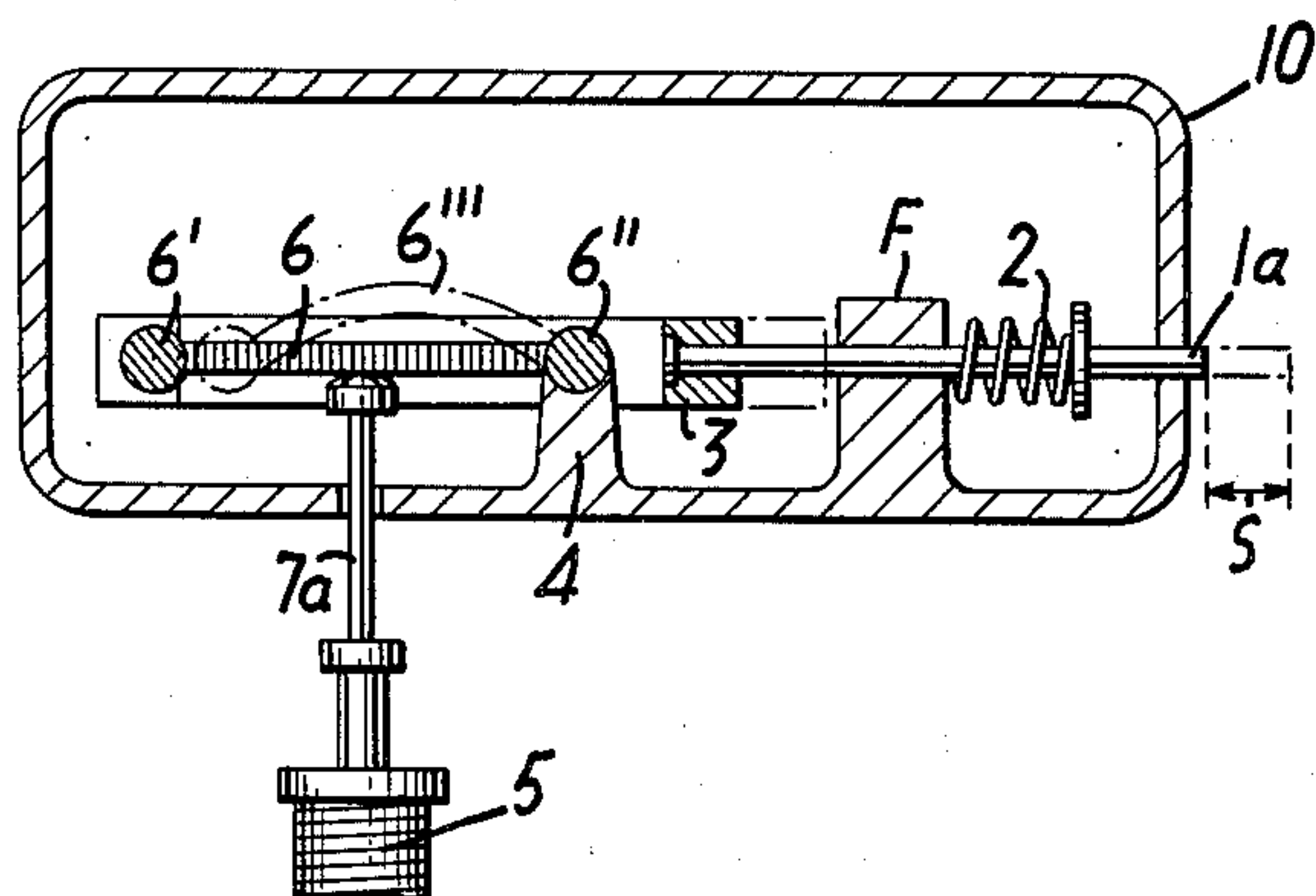


FIG. 2



1

3,101,748

MULTICOLOR WEFT REPLENISHING MEANS

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4 Claims. (Cl. 139-232)

This invention relates to a preselector for controlling the bobbin-change mechanism in a multicolor automatic loom, having a multiple shuttle box for a plurality of shuttles with various colored weft threads, a magazine with separated compartments for various colored shuttle bobbins, flaps or the like adapted each time to lock or release the lowermost bobbin of the magazine compartments, and a bobbin feeler which, shortly before the shuttle bobbin runs empty, initiates a bobbin-change.

Such prior art preselectors in looms are very complicated and therefore expensive and liable to troubles. In contradistinction thereto, the preselector according to the invention is characterized by greater simplicity, higher reliability and lower initial cost. The invention principally comprises control devices which in number correspond to that of the possible shuttles. These control devices are arranged within a movable casing coupled to the shuttle box. Each control device has a pusher which is displaceable by the action of a first spring and has associated therewith a linearly mounted second coil spring which, in linear position, holds the pusher against the action of the first spring, and is transversely deflected by a pin movable normal to the second spring's longitudinal axis. In any position of the casing according to the momentary position of the shuttle box, a control device pin is actuated by the action of a stationary impulse transmitter controlled by a feeler. The pusher associated with the respective pin cooperates with an associated drawhook to actuate a flap or the like of the respective magazine compartment. The drawhook is pivoted by the pusher into the path of a knife which reciprocates once in each working cycle of the shuttle.

Further features of the invention will appear from the following description and claims, taken in conjunction with the accompanying drawing which shows, only by way of example, one embodiment of the object of invention.

In said drawing:

FIG. 1 is a perspective view of the preselector with bobbin magazine, shuttle box and weft feeler in diagrammatic representation;

FIG. 2 is a sectional view of the preselector casing with the control devices therein.

Referring to FIG. 1, the preselector comprises a casing 10 which, by means of an axle 11, is pivotally secured on a stationary frame part and connected to a shuttle box 19 through the compound levers 13, 17 and 18. A torsion spring 12, which at one end is attached to the stationary (fixed) frame part and at the other end on a clamp on the shaft 11, tends to oscillate the casing clockwise to thus equalize the weight of the shuttle box 19 through the linkage 13, 17, 18. This shuttle box comprises four cells 20 to 23 taking four shuttles which contain bobbins filled with different colored weft. By rocking a shaft 24 through a lever 25 and the rod 18, the shuttle box 19 can be raised and lowered so as to cause each of the four shuttles to come into working position. This movement of the shuttle box is controlled (in a way not shown) from a pattern card, on which is indicated the sequential order of the colors of the weft threads to be inserted into the fabric being made by the loom.

On the casing 10 are mounted four pins 7a, 7b, 7c, 7d which are assigned to the four cells 20-23 of the shuttle

2

box 19. By rocking the casing 10 through the rod 13, each of these pins can be brought before an armature of a magnet coil 5, i.e. if the shuttle box is in a working position the respective pin is in the range of the electromagnetic coil 5. Further, from said casing there project four pushers, 1a-1d which serve for rocking four associated drawhooks 14a-14d into the range of action of a knife 16 which is pivotally mounted on a shaft 26. The four drawhooks 14a, 14b, 14c, and 14d are separately rockable about an axle 27 to respectively engage and disengage release levers 15a, 15b, 15c, 15d. The bobbin release levers, oscillatably carried on the shaft 26 are associated respectively with four roller levers 28a, 28b, 28c and 28d, the roller levers being respectively fitted with rollers 29a, 29b, 29c and 29d for engaging the bobbin release levers 15a-15d respectively. The parts having similar letter designations cooperate to form similar engaging linkages. Thus drawhooks 14a, release levers 15a, roller levers 28a, and idlers 29a form an engaging linkage and similarly for the other parts having the same letter designations. The roller levers 28a-28d are respectively fixed to the locks 30a, 30b, 30c and 30d which are respectively located under one of the compartments 31a, 31b, 31c and 31d respectively of a bobbin magazine 32. Beneath the locks 30a-30d there is arranged a bobbin feed channel 33 which, by means of a lever 34, is rockable about an axle 35. Located in said channel 33 is a bobbin slide 36 which, by means of a lever 37, is pivoted to the shaft 26 and can be rocked by each of the bobbin release levers 15a-15d. A bar 38 prevents the bobbins from falling out of the bobbin feed channel 33. When knocking the bobbins from the channel 33 into the shuttle, said channel fixed to the lever 34 can be rocked about the axle 35 so far that the distance between the edge 33a of the channel and the bar 38 is large enough for the bobbin to pass through.

A magnet coil 5 is electrically connected to a weft feeler or sensor 41 which has two prongs 41a and 41b feeling the yarn supply on the bobbin 40 of the shuttle. The magnet coil 5 serves as impulse transmitter for actuating the pins 7a-7d.

The casing 10 contains four identical control devices, one of which is visible in FIG. 2 with pin 7a and pusher 1a. In a guide F, forming part of the casing, the pusher 1a is movable endwise. A strong first coil spring 2, which is arranged on the pusher 1a between the end of the guide F and a collar, tends to move the pusher to the right, whereby its end protrudes out of an aperture in casing 10, as indicated in broken lines. The other end portion of the pusher is designed as a longitudinally slotted piece 3. Between its limbs it takes a second cylindrical coil spring 6 almost filling up the slot. One end of this coil spring is at 6' pivoted to the rear end of said slotted piece, whereas the other end is at 6'' swivably connected to a stud 4 located within the casing 10 and engaging the slot. The dimensions of the coil spring 6 and the number of its windings are such that, in the retracted position of the pusher 1a, as shown in FIG. 2, the spring 6 lies completely straight with its windings firmly against each other. The spring 6 then forms so-to-say a rigid element between the spring swivel points 6' and 6'' and locks the pusher 1a against axial displacement by the action of the compression spring 2. Between the swivel points 6' and 6'' of the lock spring 6, approximately in the middle, the casing 10 has movably guided thereon the pin 7a at right angles to the axis of the pusher. Said pin 7a bears laterally on the windings of the lock spring 6.

The action of the described preselector is as follows:

In that cell of the shuttle box 19, which then is in the working position, the bobbin 40 of the shuttle 39 is felt by the weft feeler. If, for instance, the first cell 20 is in the working position, the casing 10 is oscillated through

3

the linkage 18, 17, 13 so that the pin lies in the range of action of the magnet coil 5. As soon as a shuttle bobbin is exhausted, both prongs 41a and 41b come into contact with a metal sleeve of the bobbin body so as to connect the two prongs conductively. Thus the magnet coil 5 becomes energized, and its armature pushes the pin 7a into the casing 10. The pin 7a exerts a lateral pressure on the lock spring 6, causing this to collapse, as indicated at 6''' in FIG. 2. Thus the locking action so far exerted by the spring 6 is nullified so that the compression spring 2 becomes operative and moves the pusher 1a to the right in FIG. 2, which thus projects farther out of the casing by the distance S. The pusher 1a brings the drawhook 14a into engagement with the knife 16. As soon as the knife 16 is raised, driven in known manner through an eccentric disk from the loom crankshaft, not shown, the knife engages the drawhook 14a and along with it oscillates the bobbin release lever 15a about the axle 26. The lever 15a operates the roller lever 28a via roller 29a. Thus the flap or lock 30a will be opened to allow a single shuttle bobbin to pass. This bobbin comes from the magazine compartment 31a into the weft transfer channel 33 and is pushed therein by the bobbin slide 36 against the bar 38. At this place, the bobbin can be forced into the shuttle 39 in known manner by the battery hammer (not shown), the bobbin feed channel 33 being rocked to such an extent as to allow the bobbin to pass between the bar 38 and the edge 33a of said channel 33.

What I claim is:

1. A preselector for controlling the bobbin-change mechanism in a multicolor automatic loom, said loom having a multiple shuttle box for receiving a plurality of shuttles and movable to a shuttle working position for each of said shuttles, a bobbin magazine with separated compartments for holding bobbins filled with various colored yarns, flap means for each of the magazine compartments for selectively releasing the lowermost bobbin therein and a shuttle bobbin feeler which initiates a bobbin-change, said preselector comprising: a movable casing coupled to said shuttle box; a plurality of control devices arranged in said casing which correspond in number to that of said plurality of shuttles, said devices being operably connected to said bobbin feeler and to said flap means for releasing a bobbin, each of said control devices comprising a pusher mounted slidably in said casing to extend and retract an end for activating said flap means, a first spring mounted to bias said pusher longitudinally outward to extend said end, a second coil spring mounted to extend linearly in compression with

4

adjacent coils in contact and with oppositely disposed ends pivotally fastened respectively to said pusher and said casing for biasing said pusher oppositely to said first spring and holding said end retracted against the action of said first spring when extending linearly, a pin mounted in said casing and movable normal to the longitudinal axis of said second spring for deflecting said second spring normal to said longitudinal axis for reducing its opposite bias from more to substantially less than the bias of said first spring, a stationary impulse transmitter means mounted adjacent to said casing and operably connected to said bobbin feeler for individually activating said pins, whereby in any position of said casing associated with a shuttle working position of said shuttle box, a pusher associated with the shuttle in the shuttle work position is actuated by the bobbin feeler and an empty shuttle bobbin to activate the flap means for releasing a full bobbin from the associated magazine compartment.

2. A preselector as defined in claim 1, further comprising a pin oscillatably supporting said casing, a torsion spring mounted to bias said casing around said pin in one direction, and linkage coupling said casing to the shuttle box to turn said casing in the opposite direction to the bias of said torsion spring for positioning said casing in accordance with the shuttle working position of said multiple shuttle box.

3. A preselector as defined in claim 2, wherein said shuttle box is disposed so that the weight thereof opposes the torsion spring bias transmitted by said linkage to the shuttle box.

4. A preselector as defined in claim 1, including a plurality of pivotally mounted drawhooks each having a back face and in which each pusher end engages the back face of a respective drawhook, each back face being constructed as a control cam effective to return the respective pusher against the action of said first spring of the control device until the second spring resumes its linear position.

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