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SHUTTLE PLACING MECHANISM

Original Filed Aug. 29, 1933

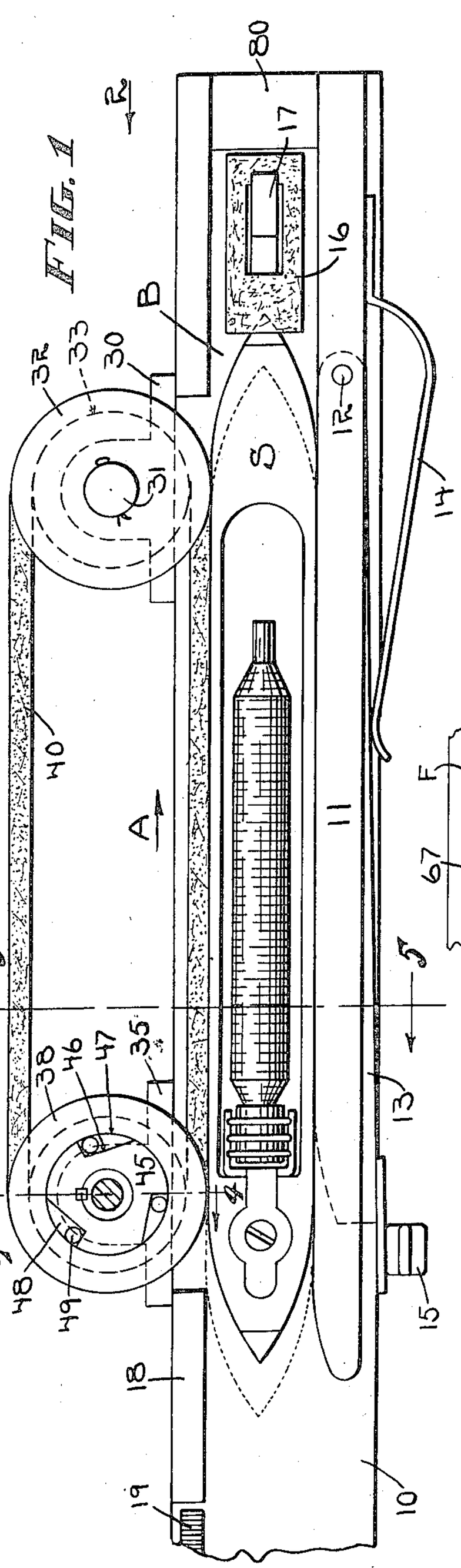

FIG. 1

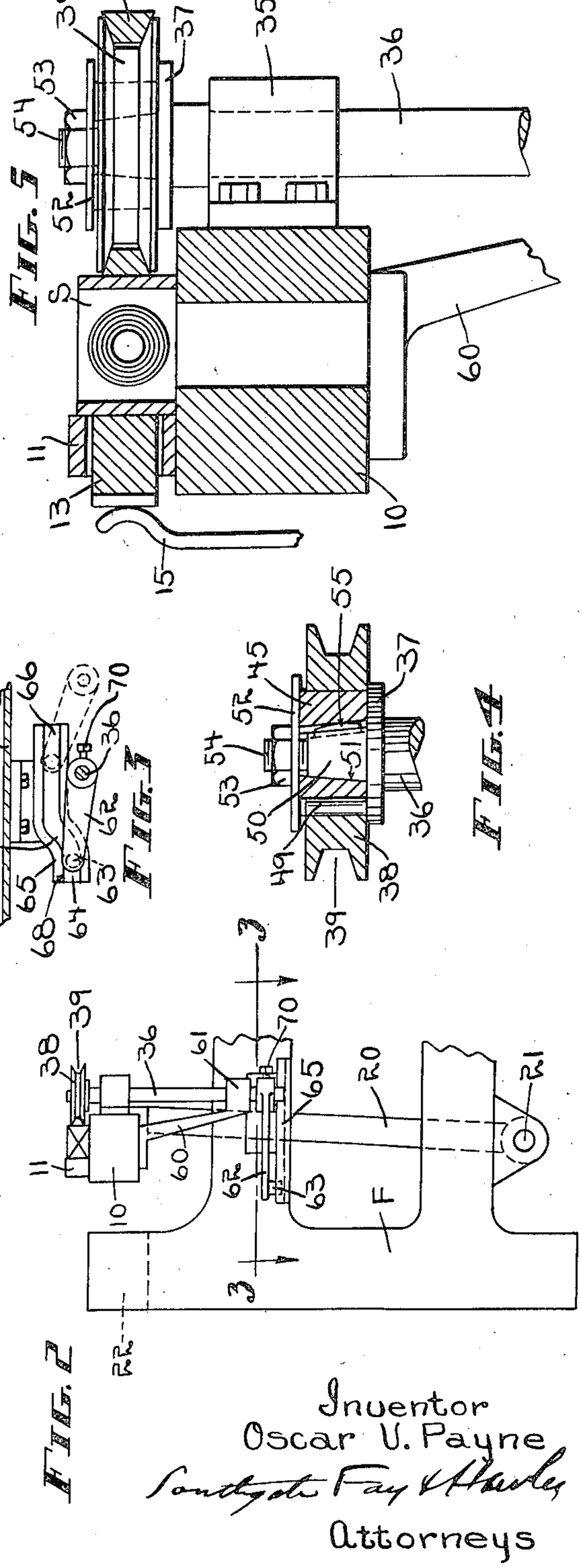

FIG. 5

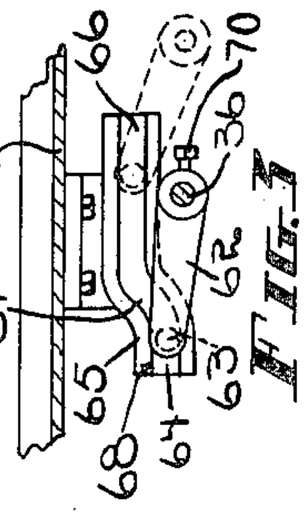

FIG. 7

FIG. 4

FIG. 2

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SHUTTLE PLACING MECHANISM

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16 Claims. (Cl. 139—252)

This invention relates to a shuttle placer for looms and it is the general object of the invention to provide means operative to insure the proper location of the shuttle with respect to the picker prior to the picking operation.

In the usual loom the shuttle enters the shuttle box with sufficient force to rebound due to the inability of the binder or shuttle check to absorb all of the energy of motion of the shuttle before the latter strikes the picker. The amount by which the shuttle rebounds, however, is not always the same, and the picker must travel different distances before engaging the shuttle with a resultant unevenness in the picking. It is an important object of my invention to provide means operative after the shuttle has had opportunity to rebound to move it out toward the picker so that there will be uniformity in successive picks with attendant even running of the shuttle.

It is a further object of my invention to place the shuttle by friction means in contact with the shuttle at the time of the placing operation, so that even though the shuttle be only slightly misplaced, the friction means can slide along the shuttle, or on the device which moves it, after the shuttle is placed.

It is a still further object of my invention to provide a form of shuttle placer which shall also be capable of resisting movement of the shuttle. In this connection the same surface which frictionally returns a rebounded shuttle to its proper position acts also to check the shuttle against rebounding. The shuttle placing mechanism will operate whether the shuttle rebounds, is boxed correctly in the first instance, or is unable to reach the picker under its own power, and these results are accomplished by the same travelling surface.

It is another object of my invention to provide a shuttle placer which shall lie to one side and along the path of the picker so that a relatively large surface contact may be had between the shuttle and the placer without interference on the part of the picker, and also to permit the placer to serve as one side or part of the shuttle box at the time of picking.

With these and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described and set forth in the claims.

In the accompanying drawing, wherein a convenient embodiment of my invention is set forth,

Fig. 1 is a top plan view of a lay having my invention applied thereto,

Fig. 2 is a side elevation on a reduced scale showing diagrammatically the relation of the invention to certain parts of the loom,

Fig. 3 is a detailed horizontal section on line 3—3 of Fig. 2,

Fig. 4 is a detailed vertical section on line 4—4 of Fig. 1 showing the control means for the belt, and

Fig. 5 is a vertical section on line 5—5 of Fig. 1.

Referring to the drawing, I have shown a lay 10 having a box front 11 pivotally supporting at 12 a shuttle binder 13. The latter is urged yieldingly rearwardly by binder spring 14 and at the inner end has engagement with a protector finger 15. A picker 16 is propelled by the picker stick 17 to pick the shuttle S from the shuttle box designated generally at B. A box back or shuttle guide 18 may be carried by the lay in alignment with reed 19. The lay is mounted on swords 20, one of which is shown in Fig. 2 as pivoted about rocker shaft 21, and driving connections not shown but of usual construction move the lay toward and from the breast beam 22. The matter thus far described may be of common construction and of itself forms no part of my present invention.

In carrying my invention into effect I secure a stand 30 to the rear of the lay adjacent the outer end thereof, as shown in Fig. 1, and secure in said stand a stud 31 upon which is rotatably mounted a pulley 32 having preferably a groove 33. In the present instance this pulley or guide is mounted for free rotation about the stud 31, although this is not essential to certain features of my invention.

A second stand 35 is also secured in the back of the lay but nearer the center of the loom than stand 30 and has projecting upwardly therethrough a shaft 36 having a shoulder 37 on which rests a second guide or pulley 38. The latter is also provided with a groove 39 which receives a shuttle engaging belt 40.

The pulley 38 is bored out to receive a clutch member 45 having notches 46 which define with the internal bore 47 of the pulley wedge shaped pockets 48. Located in these pockets are vertical pins or rollers 49 which are slightly less in diameter than the widest part of the pockets. The upper part of the shaft 36 is turned to have a conical head 50 which is received by a corresponding conical bore 51 in the clutch member 45. A washer 52 extends over the pockets to

retain the rollers and is held against the clutch by a nut 53 on the upper reduced threaded end 54 of the shaft. The clutch member is connected to the shaft 36 by a key 55 so that rotation of said shaft causes a corresponding rotation of the clutch member.

The lay has secured to the lower side thereof a depending stand 60 with a bearing 61 through which the shaft 36 extends. The bottom of the shaft has secured thereto an arm 62 the forward end of which is provided with a roll 63. The latter extends into the groove 64 of a cam 65 secured to the loom frame F. The cam has a dwell portion 66 at the rear thereof and a riser 67 which may terminate in a second short dwell 68. Since the arm 62 is secured to the shaft 36 as by a set screw 70, back and forth motion of the lay will result in movement of the roll toward and from the frame F to produce an oscillation of the shaft 36.

In operation, the shuttle will ordinarily be picked when the lay is on so-called top center and moving rearwardly, or at a point approximately one-half way between the front and back extreme positions of the lay. During the flight of the shuttle the lay moves rearwardly, and also generally moves forwardly somewhat before the shuttle is completely boxed and during this part of the lay motion when the shuttle is in flight the roll 64 is in the dwell 66 of the cam slot. After the lay has moved forwardly to a point where the shuttle is boxed if protection is to be avoided, the roll will engage the riser 67 the effect of which will be to cause a counter clockwise oscillation of the shaft 36 as viewed in Figs. 1 and 3. There results a rocking of the clutch 45 so that the reduced end of the pockets will approach the rollers, causing them to grip and turn the pulley 38 in a counter clockwise direction. The part of the belt 40 which is in engagement with the shuttle will thereupon move in the direction of arrow A, Fig. 1 so that if the shuttle be in the dotted position shown in Fig. 1 it will be moved outwardly to the full line position to assume its correct relation with respect to the picker. A stop 80 limits movement of the picker and acts to hold the shuttle against improper outward motion should it be only slightly misplaced.

When the roll reaches the short dwell turning of the shaft 36 ceases, and as the lay begins to move rearwardly the roll 63 will move inwardly along the cam 67 to give the shaft its return or clockwise movement, thereby moving the large part of the pockets toward the rolls so that the latter are released. In this way restoration of the shaft and clutch to the position normal for the backward position of the lay is accomplished without disturbing the shuttle.

At the time of picking the belt 40 is moved by its frictional engagement with the shuttle to travel around in a clockwise direction as viewed in Fig. 1 so that frictional engagement between the pulley 38 and the rollers will move the latter toward the small end of the pockets, after which further movement of the belt is resisted. The shuttle therefore is picked against pressure or resistance, as is usual.

It is to be noted that when the shuttle enters the box after being picked from the opposite side of the loom the belt is free to turn in a clockwise direction without resisting the movement of the shuttle. The previously described resistance offered to the picking of the shuttle immediately becomes operative should the shuttle attempt to rebound prior to picking. This checking of the shuttle rebound is found to be sufficient to keep the shuttle near enough to the picker so that the throw of the cam is sufficient to restore the shuttle to its proper picking position.

From the foregoing it will be seen that I have provided a movable element having a surface to engage a shuttle and define one wall of a shuttle box, the surface acting to place the shuttle against the picker. It will also be seen that the movable surface is so controlled that it tends to prevent rebounding and thereby acts initially to prevent the effect which it is to correct, in this way reducing the amount of the placing action. Furthermore, the shuttle placing mechanism is located to one side of the path of the picker where it does not interfere in any way with the picker. Also, the placer acts through a given range at each placing operation and is also in direct contact with the shuttle, but any part of the placing stroke of the belt not required to restore the shuttle to proper position results in a frictional slipping along the shuttle. Furthermore, it will be seen that the belt effectively serves as a part of the shuttle box to resist the picking of the shuttle, as is usual.

Having thus described my invention it will be seen that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. In a loom having a lay and a shuttle box and a picker to propel the shuttle out of the shuttle box, an element forming part of the shuttle box movable longitudinally of the lay, and means to move said element toward the picker when in contact with the shuttle.

2. In a loom having a lay, a picker to propel the shuttle, and frictional means movable longitudinally of the lay to engage the side of the shuttle and move the same against the picker and remaining in contact with the shuttle when the latter is picked.

3. In a loom having a lay and shuttle box movable back and forth therein, a picker to propel the shuttle, and frictional means forming part of the shuttle box to engage the side of the shuttle and dependent upon movement of the lay to move the shuttle against the picker.

4. In a loom having a lay and shuttle box movable back and forth therein, a picker to propel the shuttle, and frictional means forming one side of the shuttle box operative during forward movement of the lay to engage the side of the shuttle and move the same against the picker.

5. In a loom operating with a shuttle and picker, means having a periodic movement of given extent to engage the shuttle frictionally and move the same against the picker and remaining in contact with the shuttle when the latter is picked.

6. In a loom operating with a shuttle and having a lay and picker, a friction element extending along the lay for engagement with the shuttle, means to move said element in a direction to move the shuttle against the picker when the shuttle is boxed, and means to resist movement of the element in the opposite direction.

7. In a loom operating with a shuttle and having a lay and picker, a flexible element to have frictional engagement with the shuttle, and means to give said element a step by step move-

ment in the same direction to move the shuttle toward the picker.

8. In a loom operating with a shuttle and picker, a belt mounted for engagement with the shuttle, and a drive pulley for the belt effective to move that part of the belt in engagement with the shuttle toward the picker.

9. In a loom operating with a shuttle and picker, a belt for engagement with the shuttle, a pulley in contact with the belt, and means to drive said pulley in a direction to cause the part of the belt in contact with the shuttle to move toward the picker.

10. In a loom operating with a shuttle and picker, a pair of pulleys located at spaced points along the lay, a belt for said pulleys having a part located for engagement with the shuttle, and means to turn one of said pulleys to cause said part of the belt to move toward the picker.

11. In a loom operating with a shuttle and picker, a belt mounted for engagement with the shuttle, a pulley to drive the belt, and a clutch effective to drive the pulley in the direction only that will move the part of the belt in contact with the shuttle toward the picker.

12. In a loom having a shuttle box and operating with a shuttle and picker, a friction element forming part of the shuttle box and mounted for engagement with the shuttle, and means effective to move said element toward the picker to place a misplaced shuttle and hold said element against movement in the opposite direction to resist rebounding of the shuttle.

13. In a loom operating with a shuttle and having a lay and picker, a friction element to engage the shuttle, and means to move said element in a direction to move the shuttle toward the picker and also resist movement of said element in the opposite direction, said means remaining in contact with the shuttle when the latter is picked.

14. In a loom having a shuttle and picker, a shuttle box forming element to engage a shuttle being boxed, and means operative after the normal time for boxing of the shuttle effective to move said element toward the picker while in contact with the shuttle.

15. In a loom having a shuttle and picker, a shuttle box forming element to have engagement with the shuttle while the latter is boxed, and means operative after the normal time for boxing of the shuttle to move said element while in contact with the shuttle toward the picker.

16. In a loom having a shuttle and picker therefor, a frictional element movable toward the picker while in contact with the shuttle to place the latter and thereafter remaining in contact with the shuttle during picking of the shuttle by the picker.

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