April 21, 1953 H. H. STAUBLI ET AL 2,635,644

CLOSED SHED DOBBY

Filed Sept. 15, 1948 2 SHEETS—SHEET 1

Fig. 1.

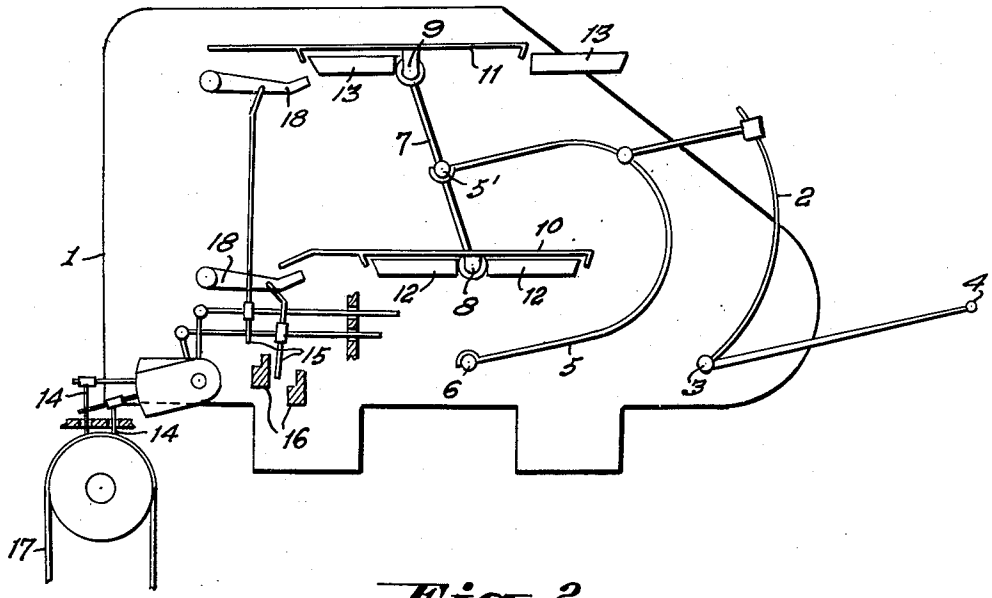
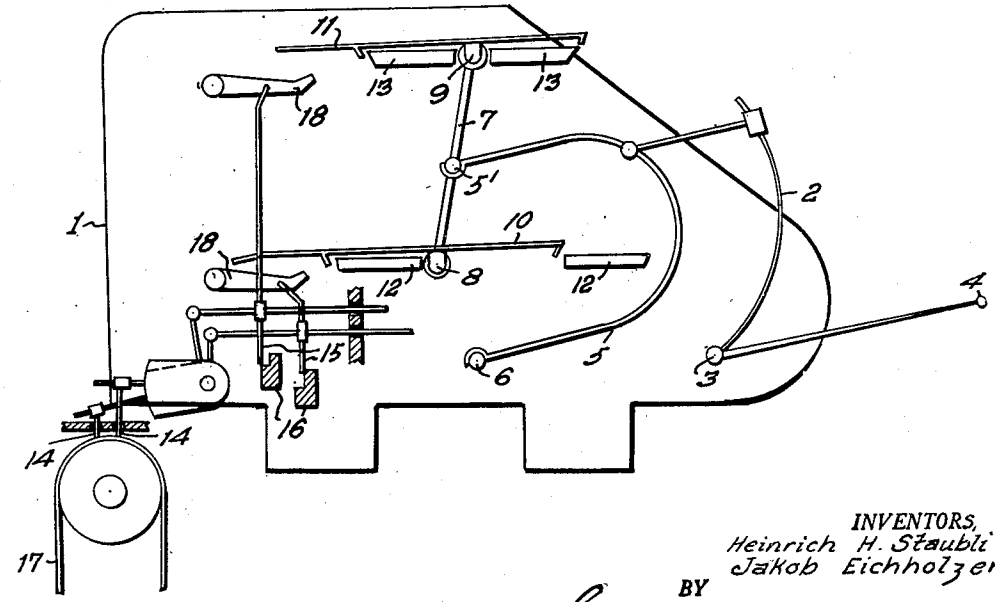



Fig. 2.




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Fig. 3.

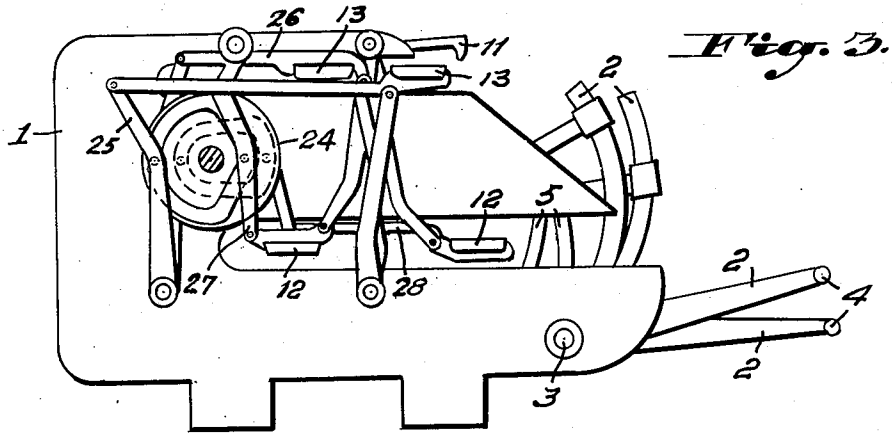



Fig. 4.

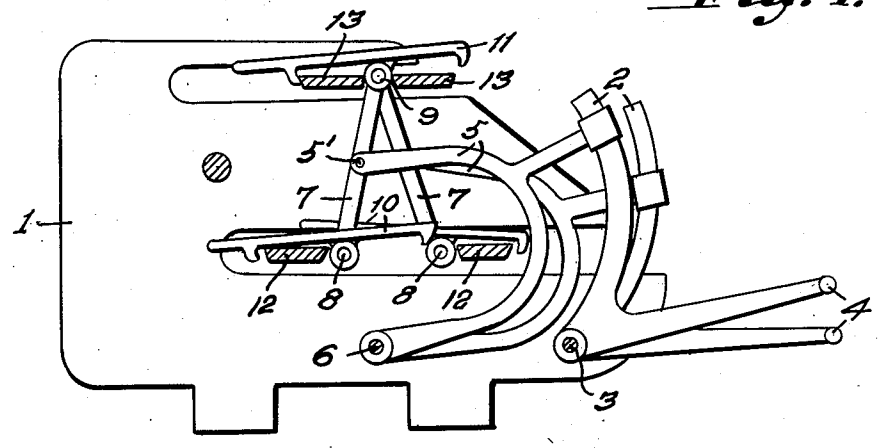
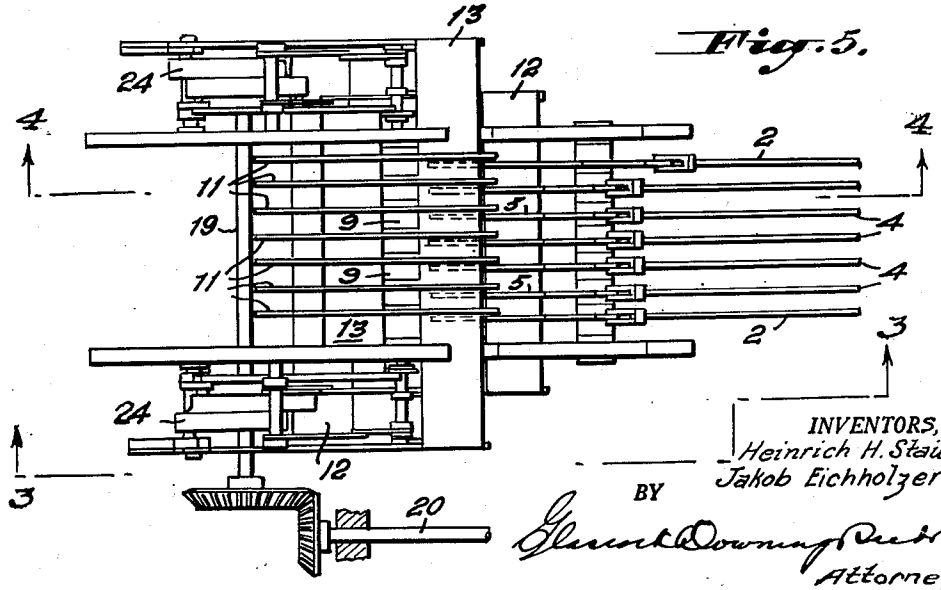



Fig. 5.




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# UNITED STATES PATENT OFFICE

2,635,644

## CLOSED SHED DOBBY

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2 Claims. (Cl. 139—68)

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In the weaving industry two systems of shedding motion are mainly in use, namely the closed shed Jacquard machine or dobby and the open shed Jacquard machine or dobby. Most extensively used are the open shed machines, since, being constructed as double lift machines, they allow to weave at a far higher speed. Closed shed machines have the characteristic, after each pick to bring all the warp threads into the middle shed, that is closed shed, so that at the moment of the beat up, all the warp threads have the same tension, which can only have a favourable effect on the quality of the woven fabric. Should a closed shed machine be successfully built, which can work at the same high speed as the open shed double lift machine, an objective aimed at for a long time will have been achieved.

The object of the present invention is to build a closed shed machine which can run at the high speed of a modern loom. Closed shed machines are known, in which the change of the hooks actuating the shafts or healds takes place at the moment of the throw of the reed. At this moment, however, there is only a very short time available for unhooking the hooks from and hooking them on the knives, so that at a speed of over 140 revolutions per minute the reliability with which the machine functions suffers. In the dobby according to the present invention the problem of the change of the hooks at the moment of the beat up of the reed is solved in such a manner that the operation is also carried out on the double lift principle, the dobby having two pairs of knives, of which one actuates the even picks and the other the odd picks and which bring the shafts pick by pick into the middle shed and from there again carry out the shedding.

The invention will now be described with reference to the accompanying drawings in which Figure 1 is a diagrammatic view partially in section of the invention as embodied in a machine utilizing the double lift principle illustrating one position of the knives and a balk lever, Figure 2 is a similar diagrammatic view illustrating another position of the knives and balk lever, Figure 3 is an end elevation taken on line 3—3 of Figure 5 and illustrating drive for the knives, Figure 4 is a view partly in section and partly in elevation taken on line 4—4 of Figure 5, and Figure 5 is a top plan view of the mechanism for moving the knives.

Between the frames 1 each shaft lifting lever 2 is mounted so as to be capable of oscillating about a shaft 3. This shaft lifting lever 2, on

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which the shafts (not shown) are suspended at 4, is connected at one end with an oscillating lever 5 in an adjustable manner. The oscillating lever 5 is mounted so as to be capable of oscillating on a shaft 6 and is provided at its free end with a bearing 5' for a baulk lever 7. This baulk lever is provided at each of its ends with the bearings 8 and 9 constituting floating pivots for the double hooks 10 and 11. The double hooks 10 and 11 coact each with a pair of knives, the double hook 10 with the pair of knives 12 and the double hook 11 with the pair of knives 13.

The double hooks 10 and 11 are controlled in a known manner by means of a vertical needle apparatus according to a pattern to be hooked on to their appropriate knives of a pair and are so formed that, if a hook is hooked on a knife, the other hooked end of the double hook is raised from its knife. The control members comprise the reading needles 14 and the transmission wires 15 which by means of stepped rails 16 are raised or not raised, according to whether the reading needles rest on the pattern card 17 or have fallen into a hole of the pattern card 17. The wires 15 with their upper ends act by means of the hook levers 18 mounted loosely on a corresponding shaft between the frames 1 on the extension of the hooks 10 and 11 respectively.

As illustrated more in detail in Figures 3 to 5, the knives are reciprocable and are driven by multiple cams 24 mounted externally of the side frames 1 of the machine. The knives 13 in the upper bank or lift are reciprocated by respective lever trains generally indicated at 25 and 26 and the knives in the lower lift are reciprocated by lever trains 27 and 28 respectively. The multiple cams 24 are driven by a shaft 19 operated by a suitable drive mechanism including meshing beveled gears driven from the shaft 20. As indicated, the cam tracks are such that the levers 7 are held temporarily stationary when as shown in Figure 4 the upper knives 13 come together and abut the floating pivot or bearing 9.

The pairs of knives operate in the following manner:

The knives of the two pairs of knives cause the raising of the shafts for the even picks out of the middle shed into the upper shed and the other knife of the same pair of knives draws the shafts out of the middle shed into the lower shed. Both knives bring the withdrawn hooks back into the position of rest. The other pair of knives actuates the shafts for the odd picks in exactly the same way as the pair of knives for the even picks. During the time interval of one pick one

of the pairs of knives remains in its position of rest or initial position, in which the control of the corresponding hooks takes place, so that there is sufficient time available for controlling the hooks.

When the hook levers 18 are lifted by the wires 15, they lift the hooks of the double hooks 10 and 11 respectively from the associated knives, so that the oppositely located hooks of the double hooks will engage at the oppositely disposed knives. The motions of the stepped rails 16 are of course synchronised with the motions of the lifting knives, so that those double hooks are controlled, the associated knives of which are in their basic position.

From the figures of the drawing it will be seen, that each pair of knives is in the basic position during the operative period of the other pair of knives and remains in that position and, for instance, holds the baulk levers 7 in their middle position during the period of one pick. For this reason in both Figures 1 and 2 the two knives of one pair of knives are shown in their extreme outward position, whilst the knives of the other pair are in their basic position.

Instead of the pairs of knives other members actuated from the loom by way of the dobby might be provided, which for the duration of a pick hold fast one end or the other of the baulk lever 7, during which period the control of the hooks is effected.

What we claim is:

1. In a closed shed dobby, a pair of reciprocable knives for carrying out the shedding of the even picks and remaining stationary during the odd picks, a second pair of reciprocable knives spaced apart from said first pair, for carrying out the shedding of the odd picks and remaining stationary during the even picks, baulk levers, each having a floating pivot at either end, the floating pivot on one end being held fixed while the first pair of knives is stationary, as the second pair of knives rotates the baulk lever, and the floating pivot on the opposite end being held fixed while the second pair of knives is stationary, as the first pair of knives rotates the baulk lever.



2. In a closed shed dobby, a first pair of reciprocable knives for carrying out the shedding of the even picks and remaining stationary during the odd picks, a second pair of reciprocable knives spaced apart from the said first pair for carrying out the shedding of the odd picks and remaining stationary during the even picks, baulk levers and respective shafts, each shaft adapted to be moved successively from the middle shed to the upper or lower shed, floating pivots mounted at either end of each baulk lever and disposed respectively in the path of travel of each pair of knives and between the knives of each pair, the floating pivot on one end being held fixed by the first pair of knives while stationary, as the second pair of knives rotates the baulk lever, and the floating pivot on the opposite end being held fixed by the second pair of knives while stationary, as the first pair of knives rotates the baulk lever, and a lever train connected to each baulk lever intermediate its ends and to the shaft for moving the shaft.

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