

[54] **DOUBLE-LIFT DOBBY**

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[58] Field of Search139/71, 74, 68, 66 A, 331

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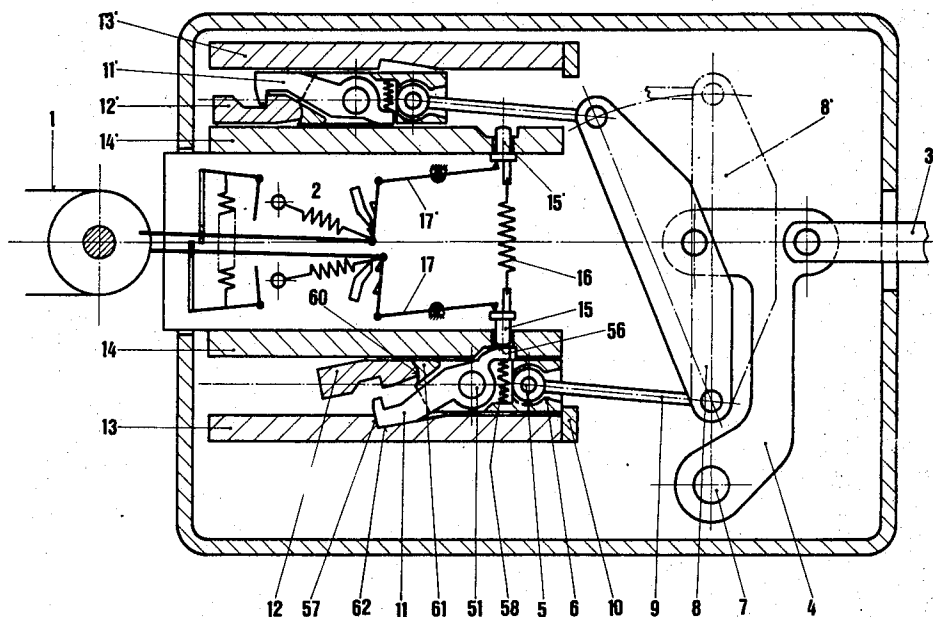
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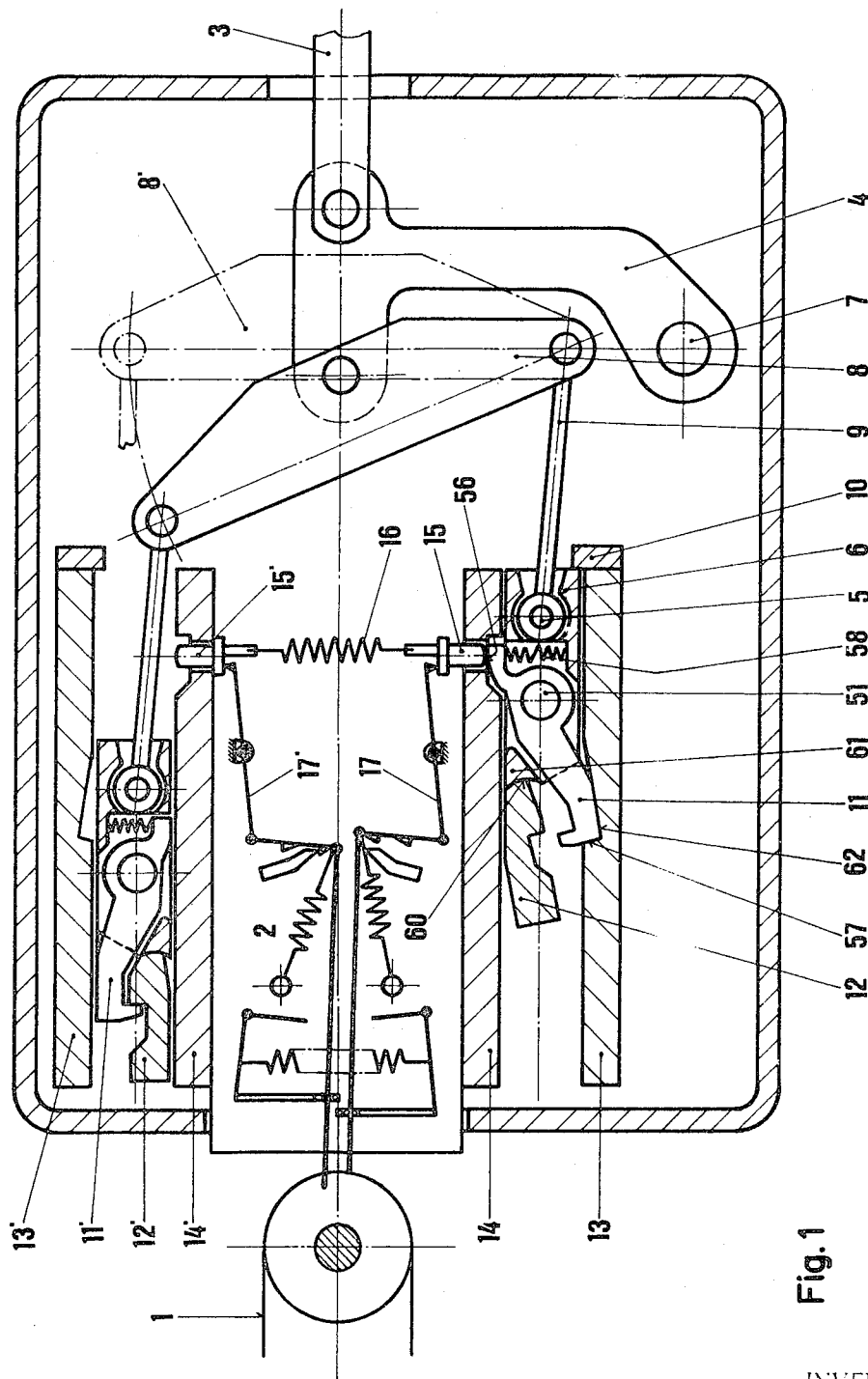
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[57] **ABSTRACT**

A double lift dobby with a balance for each heald and with a draw hook for each end of the balance. The dobby also includes a draw knife slidably arranged in the same guideway with the draw hook so that, whenever the draw hook is hooked in or engages the draw knife, both the draw hook and draw knife are guided within the single guideway so that no relative motion takes place between the draw knife and the draw hook during the whole of their commonly executed movement.

11 Claims, 3 Drawing Figures





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Fig. 2

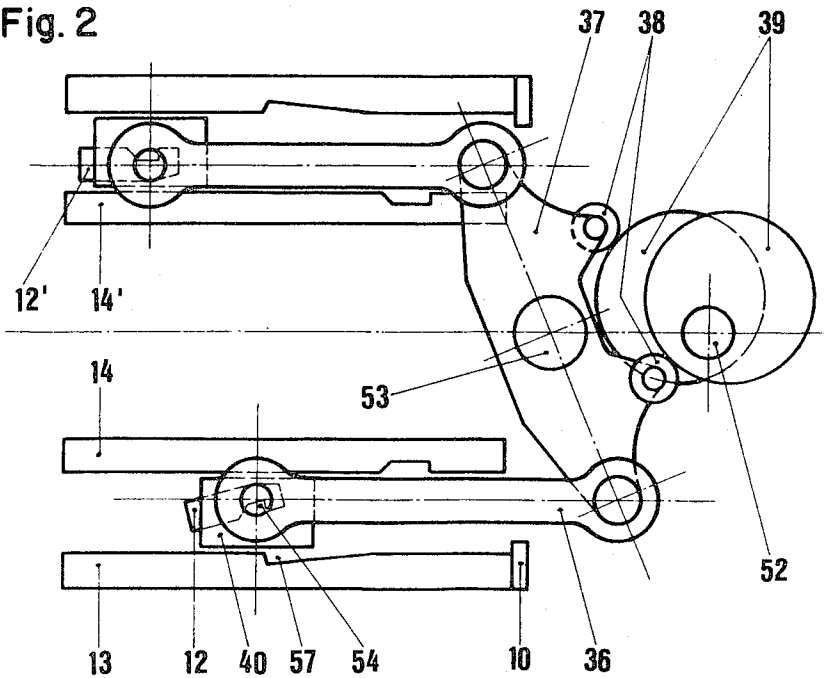
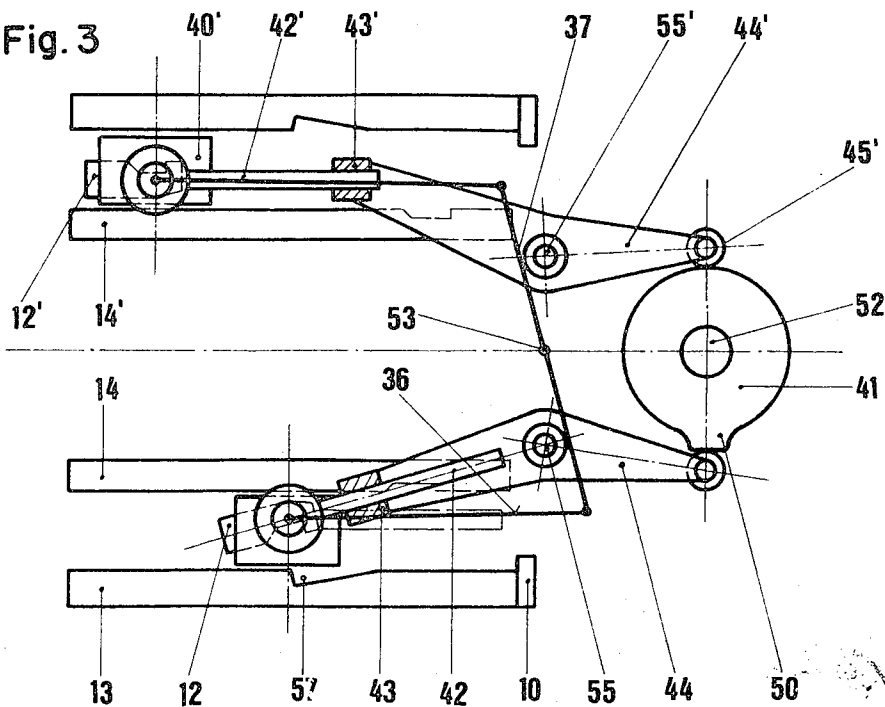


Fig. 3



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DOUBLE-LIFT DOBBY

The invention relates to double lift dobbies, and relates particularly to double lift dobby of the Hattersley type, with a baulk for each heald shaft and with a draw hook for each end of the baulk, this draw hook being retracted, after it has been subjected to a controlling action, by a draw knife.

For reasons of safety and also to ensure smooth operation of the dobby, dobbies of this type are subject to the requirement that the connection between draw hook and draw knife is maintained during the whole drawing-out movement, and that the draw hook is guided free from play in both directions of movement. In known double lift dobbies the draw hook and draw knife, which engage one within the other, execute movement relative to one another in the course of their reciprocating working strokes, and this relative movement results in wear at the engaging surfaces.

The present invention has the object of providing a double lift dobby which ensures smooth and reliable operation substantially without wear occurring at the interengaging surfaces.

The dobby is characterized according to the invention in that both the draw knife and also the draw hook are arranged in one and the same guideway and, whenever the draw hook is hooked in or engages in the draw knife, both the draw hook and draw knife are guided within this single guideway, with the result that no relative motion takes place between the draw knife and draw hook during the whole of their commonly executed movement. The said slide is preferably of rectilinear shape. As a result of rectilinear motion of the interengaging draw knife and draw hook, wear is prevented from occurring at the surface of common contact.

A further advantage results from the guidance of the hooks in the guideway in the sense that, whenever the draw hook is hooked into or engages in the draw knife, the draw hook is prevented by this guideway from becoming unhooked (detached) from the draw knife while the latter is being shifted; thus, the draw hook is locked to the draw knife during the reciprocating movements of the latter, and cannot jump out of the draw knife. This is desirable because, if the draw hook were to become disengaged from the draw knife, this could have serious results and harm correct operation of the dobby.

The dobby may be of the type of positive or negative motion; whichever type of dobby is selected will depend on the construction of the draw hook and its associated knife. In the first case the draw knife can be constructed as drawing and pushing knife.

An embodiment of the present invention will now be described by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a diagrammatic elevational view of the manner of construction of a positive double lift dobby loom; and

FIGS. 2 and 3 illustrate the mechanisms whereby the draw knives are driven.

In FIG. 1 there is shown a reading-in device 2 by means of which the dobby is controlled and which constitutes the subject matter of a separate patent application with the same date as the present application. The shedding mechanism of the Hattersley system, which is described below, functions independently of the manner of construction of the reading-in or sensing system 2 and also independently of the type of pattern card 1 which is employed.

Jack lever 4 is articulated to the center of the baulk 8 and is pivotably mounted on the axle 7; a second baulk 8' is shown in broken lines and in the nonlifted position. A pull or draw member 3 extends to the shaft, which is not illustrated. A connecting rod 9 is pivotably secured to each end of the baulk, the other end 5 of this connecting rod 9 being pivotably mounted as by a pin 5 in the slide 6. Slide 6 is slidably arranged in the guideway 13, 14 and carries a pin 5 on which hook 11 is pivotably mounted. Rod 9, slide 6, pin 51 and hook 11 together constitute the assembly which is referred to as a draw

The extent of possible sliding motion within the guideway and in the direction of the baulk 8 is limited by the pusher rail 10.

The draw knife 12 which is also shaped in the manner of a hook lies opposite hook 11 and at the same time within the guideway 13, 14; this draw knife extends over the width of all the baulks of the dobby, that is to say draw knife 12 cooperates with the lower end of all the baulks, while draw knife 12' cooperates with the upper end of all the baulks. The drive for the draw knives is located either to one or to both sides of the draw knives 12, 12'; the movement proper of the draw knives will be described with particular reference to the lower assembly, illustrated in FIG. 1, of draw knife and draw hook. The draw knife 12 executes two movements, viz a rectilinear sliding movement within the guideway 13, 14—this sliding movement being initiated by the mechanism illustrated in FIG. 2—and, in the rear dead center position of the draw knife, a pivotal movement in order to create or eliminate a reading-in play between the hook 11 to be controlled and the contacting surface of the draw knife 12. This pivotal motion of the draw knife 12 is initiated by the mechanism illustrated in FIG. 3.

The two cams 39 are mounted on a drive shaft 52 (FIG. 2) of the dobby and, in the course of their rotation, cause, with the interposition of rollers 38, rocker levers 37 to swivel about shaft 53, this movement being transmitted to the draw knives 12 and 12' by way of connecting rod 36 and pin 54. Pin 54 is mounted in slide block 40, the latter being guided between the guide surfaces of guideway 13, 14.

Guide 42' (FIG. 3) is fixed to draw knife 12' and enables the position of the draw knife to be determined, guide 42' being itself arranged to be slidable within the block 43' in the course of reciprocating movements of the draw knife. The block 43' itself is pivotably mounted on the double arm lever 44' which is itself pivotable about shaft 55' and slides on the cam 41 (mounted on shaft 52) by way of the second arm of this double arm lever 44 and with the interposition of roller 45'. The cam 41 is so positioned with respect to the cam 39 that, in the rear dead center position (which corresponds to the position of the lower knife as illustrated in FIG. 3), of the reciprocating motion of the draw knife, projection 50 acts on the double arm lever 44. In this way block 43 is pivoted, as is also, by way of guide 42, the draw knife 12.

The sequence of operations leading to shedding will now be described in detail with particular reference to FIG. 1. The lower knife 12 is in the rear dead center position, and draw hook 11 is in a position in which it is ready for a control action exercised by the reading-in system 2. If no hole is present in the pattern card 1, lever 17 remains in the position illustrated, and pin 15, which is held back by spring 16, cannot act on the nose or lug 56 of hook 11. This hook 11 and, by way of connecting rod 9, also the baulk remain unaffected at their lower ends. Thus, as illustrated in the lower part of FIG. 1, hook 11 remains subject to the action of the spring 58, with the result that it is held within notch 57 of guideway 13. In the course of rotation of drive shaft 52 draw knife 12 is pivoted by cam 41, with the result that the engaging surface of draw knife 12 engages with the draw hook 11, in a parallel manner and without play. This position is illustrated in the upper parts of FIGS. 1 to 3 respectively. Following this pivotal motion of the draw knife 12 the latter is retracted by the cam 39, the slide block 40, which carries knife 12 with the interposition of pins 54, being guided within the guideway 13, 14. The draw hook 9, 6, 11 which is not retracted, and with it the end of baulk 8, remain locked in the position illustrated, while the knife 12 is executing its reciprocating motion; this is because slide 6 together with hook 11 is locked in position within the guideway 13, 14 between stop 10 and notch 57.

If a hole is present in the pattern card 1, then the reading-in system 2 presses on pin 15 or pin 15' through the intermediary of lever 17 or lever 17' respectively. In FIG. 1, pin 15' is shown in the position assumed when the reading-in system encounters a hole in the pattern card. Hook 11 is then pivoted

about pin 51. The hook is pivoted from out of notch 57 and engages within the draw knife 12. The situation is thus obtained such as is illustrated in FIG. 1, upper part, with regard to draw knife 12' and hook 11'.

As FIG. 1 clearly illustrates, once the two parts (draw knife 12' and hook 11') interengage in one another, they are secured in position within the guideway 13' and 14', so that they cannot under any circumstances become unhooked or separated from one another during their reciprocating movement. During the return movement, in which the draw knife 12, 12' is now acting as pushing knife, this draw knife 12, 12' presses against the portion 61 of the slide with its rounded thrusting surface 60. Owing to the cooperation of the hooks on the one hand and on the other hand the cooperation of the said pushing surface with the slide, there is obtained a play-free guidance of the draw knife and of the draw hook during the whole drawing-out movement. Thus, we are concerned here with a positive shedding motion, with provision for causing the draw hook to be positively reciprocated. Owing to the provision of the guideway any relative motion between the draw hook and the draw knife is prevented while these parts are being moved back and forth in mutual engagement. Both of these parts execute a common and rectilinear movement which prevents any wear from being inflicted on the surfaces of mutual contact. This is true both in the case of the drawing-out movement in which the interengaging surfaces of the draw hook and draw knife are in mutual contact, and also in the case of the repulsion of these parts, in which the above-mentioned pushing surface of the draw knife is exerting a pushing force on the cooperating portion of the slide with which it is in contact. The hook proper 11, 11' is constructed as a double-arm lever, with the result that a respective surface 56 and 62 of the two arms of this lever are formed as supporting and sliding surfaces which are guided within the guideway 13, 14.

The above-described machine may be negative or positive shedding motion, that is of the kind in which the draw knives are returned under spring bias or of the type in which one of the draw knives is subjected to a thrusting force while the other draw knife is subjected to a pulling force. The form of construction selected enables, in particular in conjunction with the reading-in system, the whole mechanism to be incorporated in a housing with an oil bath; in practice this prevents wear from being inflicted at those sliding surfaces which are present.

The guideways or guide surfaces serving to guide the movement of the draw knife and draw hook, may be rectilinear or gently curved. When these guideways or guide surfaces are rectilinear and lie parallel to one another, this facilitates manufacture and also assembly of the component parts.

What we claim is:

1. In a double lift dobbie of the Hattersley type, the combination comprising:

means defining an elongated guideway, said guideway means having a pair of spaced and parallel surfaces, and at least one notch in one of said surfaces;

means defining a pivotally supported baulk;

draw knife means slidably supported in said guideway means for movement longitudinally thereof, said draw knife means having first coupling means thereon;

draw hook means including at least one rod pivotally secured to one end of said baulk, and carriage means slidably mounted in said guideway means for movement longitudinally thereof between said parallel surfaces, the end of said rod remote from said baulk being pivotally secured to said carriage means, said carriage means having a hook member pivotally secured thereto and adapted to pivot into and out of said notch, said hook member having second coupling means thereon adapted to be releasably coupled to said first coupling means, said notch preventing a movement of said carriage means along said guideway means when said hook member is engaged therewith and permitting a movement of said carriage means along said guideway means when said hook

member is free of engagement therewith, said spacing between said parallel surfaces being sufficient to prevent a disengagement of said first and second coupling means when said draw knife means and said draw hook means are moved along said guideway means.

2. A double lift dobbie according to claim 1, wherein said draw hook means includes resilient means for normally urging said hook member into said notch.

3. A double lift dobbie according to claim 2, including control means for moving said hook member out of engagement with said notch.

4. A double lift dobbie according to claim 3, wherein said control means includes a reading-in mechanism composed of a perforated pattern card, a first pin engageable with said card and receivable in selected ones of said perforations, spring means for urging said first pin against said card and a second pin movable into and out of engagement with said hook member in response to the cooperation of said first pin with said card.

5. A double lift dobbie according to claim 2, wherein said hook member extends outwardly on opposite sides from said pivotal support therefor, one side of said hook member being engageable with said notch and said resilient means being positioned between said carriage means and the other side of said hook member.

6. A double lift dobbie according to claim 2, including stop means spaced longitudinally along said guideway means from said notch and adapted to limit the longitudinal movement of said carriage means, said draw hook means being adapted to be positively secured between said notch and said stop means when said hook member is engaged with said notch.

7. A double lift dobbie according to claim 1, wherein said baulk is pivotally supported at the central portion thereof; wherein said guideway means includes a pair of guideways positioned adjacent opposite ends of said baulk; and wherein said draw hook means includes a pair of rods pivotally secured to opposite ends of said baulk and carriage means slidably mounted in each of said guideways.

8. A double lift dobbie according to claim 1, including means for pivotally supporting said draw knife means adjacent the end of said guideway means having said notch.

9. A double lift dobbie according to claim 8, wherein said pivotal support means comprises means defining a cam having an effective surface thereon, a lever pivotally supported at the central portion thereof, one end of said lever cooperating with said cam and said effective surface, the opposite end having a block thereon; and

wherein said draw knife means includes slider means slidably supported in said guideway means, said slider means having a knife member pivotally secured thereto, said knife member having guide means thereon cooperable with said block to effect a pivoting of said knife member in response to said effective surface causing a pivoting of said lever.

10. A double lift dobbie according to claim 9, wherein said block includes means defining an opening therethrough; wherein said guide means comprises a bar secured to said knife member and extending outwardly therefrom and through said opening.

11. In a double lift dobbie of the Hattersley type, the combination comprising:

means defining a pivotally supported baulk;

means defining an elongated guideway, said guideway means having a pair of spaced and parallel surfaces;

draw knife means slidably supported in said guideway means for movement longitudinally thereof, said draw knife means having first coupling means thereon; and

draw hook means pivotally secured to said baulk, said draw hook means including second coupling means adapted to be releasably engaged with said first coupling means, said spacing between said parallel surfaces being sufficient to prevent a disengagement of said first and second coupling means when said draw knife means and said draw hook means are moved along said guideway means.

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