

[54] **PAPER CARD READING APPARATUS IN A DOBBY MACHINE**

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[58] **Field of Search** 139/331, 317, 329, 68, 139/335; 66/156, 50 R

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[57] ABSTRACT

In a card reading apparatus of a Dobby machine, necessity of intermittent driving of a paper card and release of a feeler needle for the intermittent driving is eliminated, and at a continuously driven state of the paper card instructions of fabric weave may be smoothly and securely transmitted to a Dobby driven part, thus operation speed of a Dobby machine is improved.

6 Claims, 4 Drawing Figures

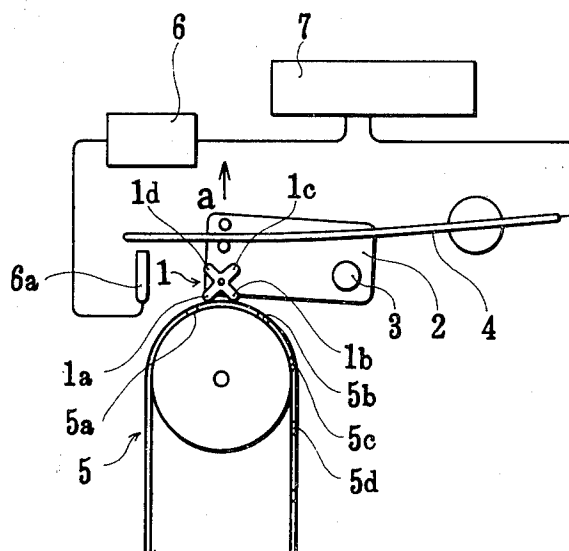


Fig. 3

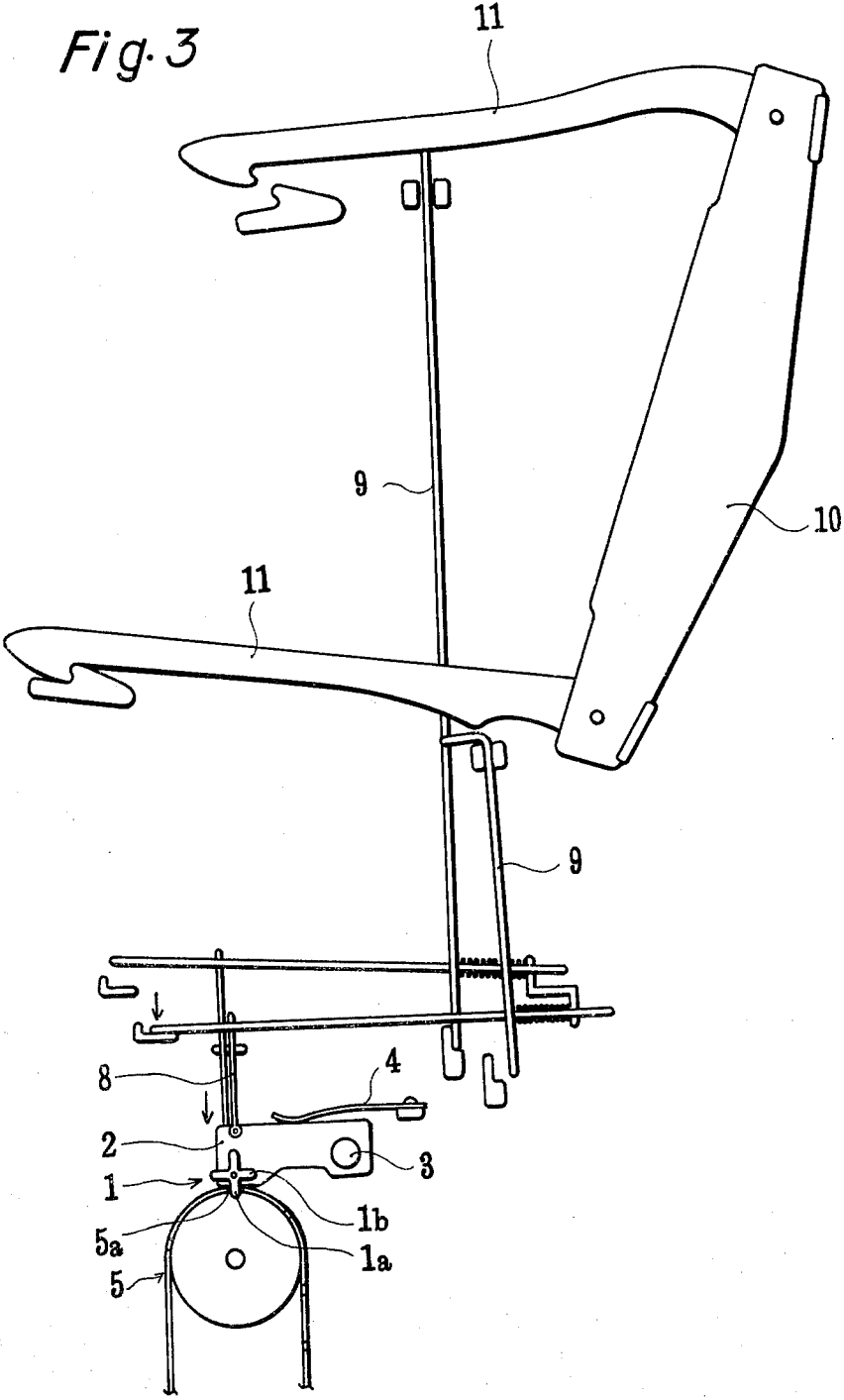
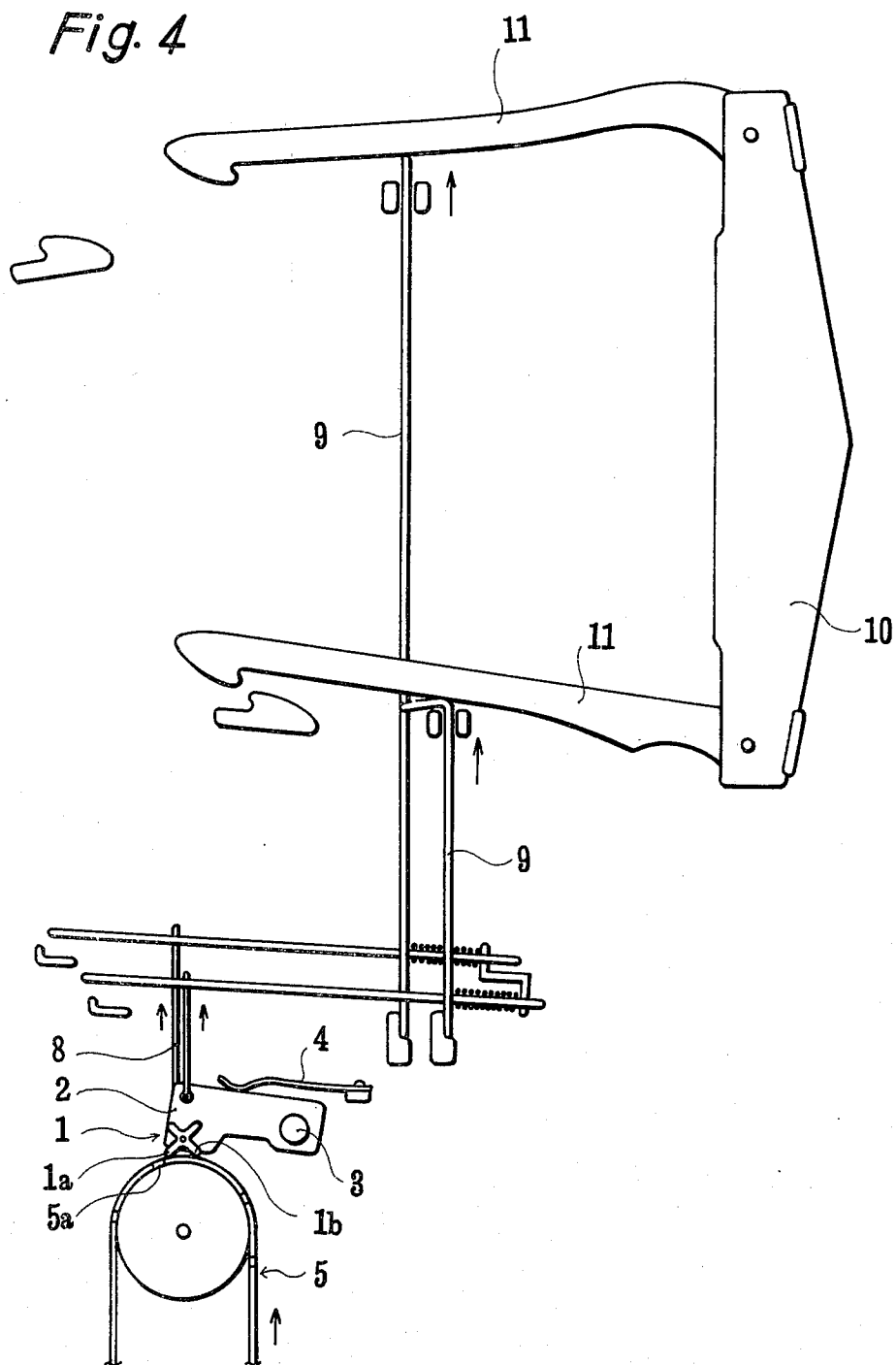


Fig. 4



PAPER CARD READING APPARATUS IN A DOBBY MACHINE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a paper card reading apparatus with simplified form for smoothly increasing a rotation speed of a Dobby machine.

2. Description of the Prior Art

At a conventional paper card reading apparatus using a feeler needle in a Dobby machine, since a rotation of a paper card is not permitted when a feeler needle is inserted in a hole of a paper card, it is necessary that a rotation of the paper card is stopped at the feeler needle inserted state and then after retraction of the feeler needle the paper card is rotated again, thus the motion of the feeler needle must be controlled at intermittent travel of the paper card.

Further, a feeler needle must be released for the intermittent motion of a paper card. In this case, intermittent drive mechanism of a paper card comprises a sprocket wheel attached at an end of a card cylinder shaft and a disc provided with a driving pin, wherein at every revolution of the disc, the pin interlocks with a tooth of the sprocket wheel, so that intermittent rotation of the paper card corresponding to one tooth stroke is performed. On the other hand, in order to release a feeler needle, since a needle for upper hook and another needle for lower hook are released so as to fit with a timing rotation and stop of a paper card, it is necessary that two sets of cam levers positioned oppositely at 180° angle to cams, connecting bar, and bell crank are combined, thereby two lattices provided with horizontal needles respectively for upper hook and for lower hook are moved vertically so as to release a feeler needle.

As above described, intermittent drive mechanism for a paper card and a feeler needle release mechanism are very complicated, moreover a timing at interlocking of a paper card and a feeler needle is severe, thereby a high-speed operation of a dobby machine is interfered with.

SUMMARY OF THE INVENTION

In order to perform a high-speed operation of a dobby machine, an apparatus according to the present invention comprises a reading lever arranged below a feeler needle for interlocking motion, rotating wheel attached to the reading lever so as to constitute a suitable number of teeth, teeth of said wheel being constituted to be readily inserted to and removed from many small holes in a paper card, elastic means arranged to the reading lever for pushing steadily the wheel towards the paper card surface, wherein teeth of the wheel are inserted in specified holes in the paper card at a continuous drive state of the paper card so that instruction of fabric wear may be transmitted to a driving part of a dobby machine.

OBJECTS OF THE INVENTION

A principal object of the present invention is to operate a Dobby machine smoothly at a high speed without necessity of releasing a feeler needle to a specified hole in a paper card at a continuous drive of the paper card.

Another object of the present invention is to eliminate a complicated mechanism for intermittent drive in the prior art and to simplify the structure.

Other objects and features of the invention will be apparent from the following description taken in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIGS. 1 and 2 illustrate an embodiment according to the present invention wherein instruction of a card is electrically transmitted to a dobby drive part, and

FIG. 1 shows a state of a wheel being pulled away from the paper card continuously rotating, while

FIG. 2 shows a state of a wheel being inserted in the paper card continuously rotating.

FIGS. 3 and 4 illustrate an embodiment wherein instruction of a card is mechanically transmitted to a Dobby drive part, and

FIG. 3 shows a state of a wheel being inserted in a hole of a paper card,

FIG. 4 shows a state of a wheel being pulled away from the paper card.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

In considering the drawings, reference is made to an embodiment of a paper card reading apparatus according to the present invention.

Referring to FIGS. 1 and 2, in a card reading apparatus a reading lever 2, a lower part of which is provided with a pivotably mounted wheel 1, is pivotably mounted by a supporting shaft 3 on a machine base.

At the same time an elastic member 4 such as a flat plate is provided in a manner that one end is fixed to a body, and the elastic member 4 pushes the reading lever 2 downwards so that the wheel 1 is contacted with a surface of the paper card 5 which is an instruction record having holes corresponding to weaving instructions to be transmitted to a loom.

Teeth of the wheel 1 comprise for example, a cross form consisting of a first tooth 1a, a second tooth 1b, a third tooth 1c and a fourth tooth 1d as shown in the drawing. Each of these teeth 1a, 1b, 1c and 1d slides on a paper card 5 as the paper card continuously rotates, thereby these teeth may be readily inserted to or pulled away from holes 5a, 5b, 5c, 5d . . . provided on a surface of the paper card.

One end of the elastic member 4 is connected to a circuit of a control magnet 7 including an energizing source 6, while the other end is constituted to contact with a terminal 6a of the source 6.

Further, in another embodiment illustrated in FIGS. 3 and 4, at upper portion of a reading lever 2 is attached a feeler needle 8 which operates a hook 11 pivoted to a vertical lever 10 through a supporting wire 9.

Operation of the present invention will be explained. Referring to FIG. 1, when a paper card or paper tape loop 5 is continuously rotated, a wheel 1 which rotates in a direction shown at the drawing, is steadily pushed onto an arcuate surface on the paper card 5 by means of the elastic member 4. When a first tooth and a second tooth are both on portions free of holes between 5a and 5b on the paper card 5, the reading lever 2 is pushed up against a pressure of the elastic member 4 in an arrow a direction around a supporting shaft as a fulcrum. Therefore, connection between the elastic member 4 and the terminal 6a of the source 6 is re-

leased so that instruction of the fabric weave is not transmitted.

Referring to FIG. 2, when the paper card 5 is rotated further and the second tooth 1b of the wheel 1 arrives at the hole 5b of the paper card, the reading lever 2 is pushed down in a direction *b* by means of the pressure of the elastic member 4, so that the second tooth 1b is inserted in the hole 5b.

At the same time, the end portion of the elastic member 4 is contacted with the terminal 6a of the source 6 to close the circuit of the control magnet 7 so that instruction of fabric weave may be transmitted to the Dobby driving part.

In this case, since the paper card 5 is continuously rotated, the second tooth 1b of the rotating wheel 1 inserted in the hole 5b is pulled away from the hole 5b and pushed to a side surface adjacent of the hole according to travel of the hole 5b towards the left, thereby both the second tooth 1b and the third tooth 1c again slide on portions of the paper card 5 free of holes so that instruction as to fabric weave is stopped.

Thus, whenever the first tooth 1a, the second tooth 1b, the third tooth 1c and the fourth tooth 1d of the wheel 1 are inserted in the holes 5a etc of the rotating paper card 5, change of fabric weave may be transmitted.

In a mechanical transmission as shown in FIGS. 3 and 4, according to vertical oscillation of the reading lever 2, a hook 11 pivoted on a vertical lever 10 is operated through a feeler needle 8 and a supporting wire 9 so that a Dobby machine is mechanically driven.

As above described, in the present invention a paper card is continuously rotated and intermittent drive as in conventional method is not performed, so allowance for timing for sensing is avoided. Further, as release of a feeler needle is not necessary because of the continuous rotating state of a paper card, smooth high-speed operation can be obtained. Moreover, since a complicated mechanism for intermittent release as in conventional methods becomes unnecessary, structure of the embodiment of the present invention is much simplified resulting in a decrease of manufacturing cost.

I claim:

1. A reading apparatus in a loom Dobby for reading weaving instructions to be transmitted to a loom comprising, means for continuously driving an instruction

record thereon in operation, said instruction record having thereon holes representative of and corresponding to weaving instructions to be transmitted to a loom, a toothed reading wheel having peripheral teeth insertable into said holes for reading of said instruction record, a reading lever pivotally mounting said reading wheel and elastically biased for engaging the teeth of said reading wheel with the driven instruction record for frictional drive of said reading wheel therefrom and insertion of said teeth into said holes when correspondence of a tooth and a hole occurs and retraction of the teeth of said wheel from said holes occurs as said instruction record is rotationally driven, and instruction transmitting means including said reading lever for transmitting the reading of said holes of said instruction record.

2. A reading apparatus in a loom Dobby for reading weaving instructions to be transmitted to a loom according to claim 1, including said instruction record medium, said instruction record comprising a tape loop.

3. A reading apparatus in a loom Dobby for reading weaving instructions to be transmitted to a loom according to claim 1, in which said reading wheel comprises at least three teeth.

4. A reading apparatus in a loom Dobby for reading weaving instructions to be transmitted to a loom according to claim 1, including means resiliently biasing said reading lever in a direction toward engaging said reading wheel with said means for continuously driving said record medium.

5. A reading apparatus in a loom Dobby for reading weaving instructions to be transmitted to a loom according to claim 1, in which said instruction transmitting means comprises feeler needles means for sensing the position of said reading lever.

6. A reading apparatus in a loom Dobby for reading weaving instructions to be transmitted to a loom according to claim 1, including electromagnetic means, a source of current for energizing said electromagnetic means, switch means closed by said reading lever when a tooth of said reading wheel is received in a corresponding one of the holes for energizing said electromagnetic means from said source of current.

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