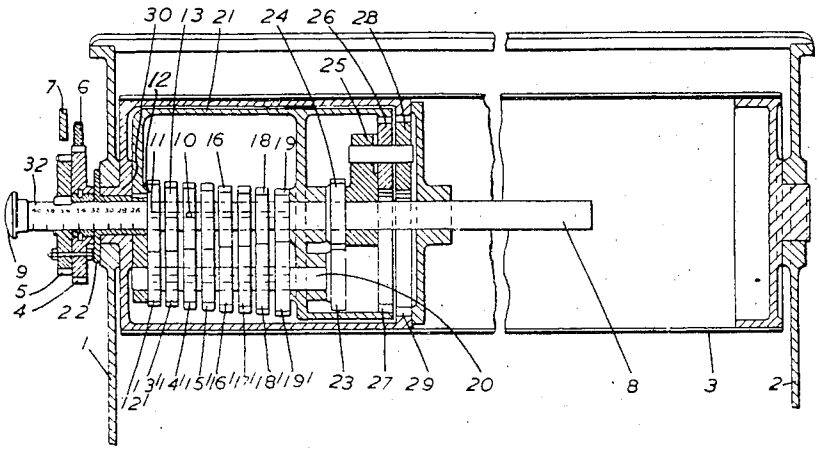
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VARIABLE SPEED SAND ROLL TAKE-UP FOR LOOMS

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VARIABLE-SPEED SAND ROLL TAKE-UP FOR LOOMS

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This invention relates to a variable speed sand roll take-up for looms.

As is known the variable speed sand roll take-up of a loom serves for adjusting the revolution of the sand roller which leads off the fabric to the so-called cloth beam. Commonly, known constructions of the positive regulator have comprised a driving gear with gear wheels, the adjustment of the necessary ratio being effected when the machine is out of use by exchanging the gear wheel having a determined number of teeth, usually selected in such a way that it corresponds to the number of picks on 1 centimetre of the fabric, i. e. the so-called set of the weft thread. Thus, for example, for a weft thread set increasing for each thread from 10 to 40 weft threads to 1 centimetre, thirty gear wheels with a number of teeth from 10 to 40 are necessary.

The equipment of each loom is therefore increased by such a set of gear wheels. The driving gear is usually disposed on the accessible part of the side wall of the frame of the loom and it is evident that with a great number of mechanisms, in particular in the case of looms, the space, already limited, is further reduced to the disadvantage of the remaining parts of the machine.

When goods with another weft thread set are to be woven then the changing of the gear wheel mentioned involves a loss in the machine output. In addition the weaver's hands are inevitably soiled with grease from the lubricated gear wheel, which may easily result in soiling the goods.

It has been suggested also to vary the necessary gear ratios by employment of a change speed gear casing, wherein the pairs of wheels having different gear ratios may be selected to give a desired speed ratio. As such casings are usually disposed on the accessible part of the side wall of the frame of the loom, it is evident that with a great number of mechanisms comprising also the connecting parts to the sand roller, the space already limited, is further reduced to the disadvantage of the remaining parts of the machine.

The object of the invention is to remove these disadvantages by providing a variable speed sand roll take-up having a change speed gear in which the desired weft thread set is obtained, without changing the gear wheels, by a simple displacement of the shaft of the change speed gear.

The main feature of the invention consists in mounting the gear casing of the regulator or take-up on the shaft of the sand roller.

According to a further feature of the invention the change speed gear is installed wholly or partly in a hollow space in the sand roller.

In addition to providing a simple and rapid adjustment of the gear for a desired weft thread set the invention provides the further important advantage of a compact construction, which effects a substantial economy in space.

One example of construction of the invention

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is illustrated diagrammatically by way of example in the accompanying drawing, which is an axial section through a warp beam regulator and sand roller.

Referring to the drawing—

In the side walls 1, 2, of the frame of the loom is mounted the sand roller 3, which is driven at a given velocity by the drive. The drive in the example illustrated comprises ratchet wheels 4, 5 which are moved by corresponding pawls 6 or 7 connected, as is customary, with the pendulum batten of the loom. The ratchet wheels 4, 5 are axially displaceably mounted on the driving shaft 8 which is journalled for rotation coaxially in an end cavity in the said roller and is axially movable therein. This shaft is provided with an operating knob 9 and, at an intermediate point, with a short spring key 10, which as the shaft is moved axially engages in one or another of the grooves 11 of the stepped wheels 12 to 19 of the driving gear, freely mounted on the shaft 8. These wheels are in constant engagement with the corresponding stepped gear wheels 12' to 19'. The latter are keyed on to the driven shaft 20 which is mounted parallel to the shaft 8 in the bearings of the stationary casing 21 connected by means of a flange 22 with the frame of the loom to hold it against movement.

The gear wheel 23 keyed on to the driven shaft 20 meshes with the gear teeth 24 of the drive member 25, which is freely journalled on the driving shaft 8 and is provided with a revolving planet wheel 26 rolling around the inner side of the teeth 27 of the casing 21. The planet wheel 26 engages with its extended part 28 in the inner teeth 29 of an internal casing or extension of the hub 30 of the sand roller 3. This casing 30 forms at the same time a container for lubricating oil in which the wheels of the shaft 20 are immersed.

The operation of this variable speed gear is as follows:

The driving shaft 8, inserted by means of the knob 9 up to a given point on the scale 32—this point of the scale corresponding to the selected weft thread set—is coupled through the spring key 10 and the groove 11 with a given transmission ratio to the driven shaft 20, which on its side, through the gearing 23, 24 and by means of the planetary drive 26, 27, 28 and 29 rotates the sand roller 3. In this way the correspondingly retarded revolution of the drive (ratchet wheels 4, 5) is transmitted to the movement of the goods.

Since, generally, it is required that the weft thread set can be increased by one thread in a relatively considerable compass a considerable number of step wheels for the drive would be necessary, which number could not be housed conveniently within the sand roller. According to my invention this difficulty can be remedied by providing the drive of the driving shaft 8 with an adjustable gear ratio. In the example illus-

trated such a ratio is obtained by providing two ratchet wheels 4, 5 with different numbers of teeth. However, only a single ratchet wheel 4 and/or 5 may be used, turned by means of the associated pawl 6 and/or 7 by one tooth, or two or more teeth, as desired.

It is evident that by selecting the diameter as well as the number of the stepped gear wheels of the change speed gear and of the drive a larger or smaller range of regulation of the weft thread set is obtained.

The apparatus described can be used without modification also for negative warp beam regulation without affecting in any way the essential feature, and without departing from the scope of the invention.

What I claim and desire to secure by Letters Patent is:

1. In a mechanical loom, a frame, a sand roller journalled for rotation in said frame, a shaft coaxial with the axis on which the sand roller is mounted, and a warp beam regulator for adjusting the speed of revolution of the sand roller, said regulator comprising a variable speed gear and a gear casing enclosing said variable speed gear, said gear casing being mounted on said shaft and within but independent of the sand roller.

2. In a mechanical loom, a frame, a sand roller having a cavity therein journalled for rotation in said frame, a shaft coaxial with the axis on which the sand roller is mounted, and a warp beam regulator for adjusting the speed of revolution of the sand roller, said regulator comprising a variable speed gear housed completely in said cavity in said sand roller, and a gear casing enclosing said variable speed gear, said gear casing being mounted on said shaft independently of the sand roller.

3. In a mechanical loom, a frame, a sand roller having a cavity therein journalled for rotation in said frame, a shaft coaxial with the axis on which the sand roller is mounted and extending into said cavity, and a warp beam regulator for adjusting the speed of revolution of the sand roller, said regulator comprising a variable speed gear housed partly in said cavity in said sand roller, and a gear casing enclosing said variable speed gear, said gear casing being mounted on said shaft independently of the sand roller.

4. In a mechanical loom, a frame, a sand roller journalled in said frame, a shaft coaxial with the axis on which the sand roller is mounted and axially movable with respect thereto, and a warp beam regulator for adjusting the speed of revolution of the sand roller, said regulator comprising a variable speed gear comprising two sets of stepped gears, the gears of one set meshing respectively with the gears of the other set and one of said sets being freely mounted on said axially displaceable shaft, a spring key carried on said displaceable shaft and adapted selectively to key any one of the freely mounted stepped gears to said shaft, and a gear casing mounted on said shaft independently of the sand roller.

5. A mechanical loom as claimed in claim 4 in which the sand roller has a cavity serving as a housing for at least a part of said variable speed gear.

6. A mechanical loom as claimed in claim 4 further comprising means for rotating the axially displaceable shaft, said means comprising an adjustable variable transmission device.

7. A mechanical loom as claimed in claim 4 further comprising a setting device including a scale associated with said axially displaceable shaft to indicate different sets of weft thread for setting said shaft to correspond to the transmission ratio desired for the variable speed gear.

8. A mechanical loom as claimed in claim 4 in which the gear casing is disposed within a hollow extension of a hub of the sand roller which serves as a container for lubricant.

9. In a warp beam regulator for looms, a hollow sand roller, a variable speed gear casing positioned within said sand roller, an axially displaceable drive shaft journalled within said casing, pairs of change speed gears within said casing, one of each pair being loosely mounted on said drive shaft for selective coupling thereto, and means for rotating said sand roller to control the weft thread set in accordance with the speed ratio of the coupled pair of change speed gears as selected by the axial position of said drive shaft.

10. In a warp beam regulator for looms, a hollow sand roller, a variable speed gear casing installed within said sand roller, a drive shaft of the change speed gear axially displaceable in the axis of sand roller and coupling pairs of speed gears for required driving speed, means for rotating said drive shaft adapted for obtaining an adjustable gear ratio, and means for controlling the weft thread set in relation to the movement of said drive shaft.

11. In a warp beam regulator for looms, a drive shaft, a hollow sand roller, a variable speed gear casing comprising an outer rotatable casing connected rigidly with the jacket of said roller and mounted freely on the drive shaft and an inner immobile casing connected with the frame of the loom, said drive shaft carrying a set of freely mounted stepped wheels, a driven shaft rotatably mounted in said inner casing and carrying a set of fixedly mounted stepped wheels, means provided on the drive shaft for keying any pair of gear wheels, and means for transmitting the movement of driven shaft to the outer casing and the sand roller.

12. In a warp beam regulator for looms, a drive shaft, a hollow sand roller, a variable speed gear casing comprising an outer rotatable casing connected rigidly with the jacket of said roller and mounted freely on the drive shaft and an inner immobile casing connected with the frame of the loom, said drive shaft provided with a scale marked with the weft thread set, and carrying a set of freely mounted stepped wheels, a driven shaft rotatably mounted in said inner casing and carrying a set of fixedly mounted stepped wheels, means provided on the drive shaft for keying any pair of gear wheels, and means for transmitting the movement of driven shaft to the outer casing and the sand roller.

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