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A NEEDLE RIBBON LOOM

This invention relates to a needle ribbon loom having a reed drive, a weft insertion needle drive and a selvedge needle drive which are each connected to a main driving shaft which extends transversely relative to the fabric web, the reed drive and the selvedge needle drive each being formed of pivoted linkages; and having a shedding drive comprising an auxiliary drive shaft driven from the main drive shaft.

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Needle ribbon looms of this kind are known,
for example, from German Offenlegungsschrift No.
1535306. In these known needle ribbon looms, the
reed drive and the weft needle drive, the selvedge
5 needle drive and the shedding drive are derived from
a common main driving shaft. The selvedge needle
drive comprises a cam disc in a cam groove of which
is a follower which acts on the short arm of an
angle lever swingable about a pivot pin. The angle
10 lever is further connected, by way of a guide rod,
to a slide to which a selvedge needle is fastened.
The reed drive has a reed which is swingable about a
shaft which is operated, by way of an articulated
linkage, from a crankpin of the shaft. The shedding
15 drive comprises an auxiliary driving shaft which is
connected, by way of a pair of spur wheels, to the
main driving shaft so that it cannot brake the overall
drive of the needle ribbon loom. This auxiliary
driving shaft extends parallel to the main driving
20 shaft.

The known needle ribbon loom furthermore includes
a weft needle drive which is similarly connected to

the main driving shaft, but has a very complicated construction. To begin with, the weft needle drive possesses a pair of bevel wheels which connect the main driving shaft to a further vertical shaft at 5 the upper end of which is a disc which carries a planet wheel meshing with a stationary sun wheel so as to move the sun wheel by the disc. The planet wheel is pivotally connected to the end of a guide rod, the other end of which is rotary on a triangular 10 carrier having bearings. These bearings slide on horizontal parallel rods. The carrier contains an adjoint-piece on which the weft needle is securely arranged. This extremely complicated construction of the weft needle drive involves considerable disadvantage- 15 ages. To begin with, the weft needle drive, with its many parts, involves a mass which, because of its considerable inertia forces, does not permit rapid operation. Added to this is the fact that the pair of bevel wheels are subjected to high loading and they 20 wear rapidly, so that on the one hand the weft needle drive can rapidly become unreliable and on the other hand the bevel wheels create considerable noise. The same holds true, also, for the toothed wheels in the planetary gearing. Furthermore, lubrication of the

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toothed-wheel gearing causes considerable difficulties, since such gearing has to run in an oil bath which is exposed to considerable heat. All this means that the known needle ribbon loom requires constant maintenance; nevertheless because of the rapid wear, it very quickly decreases in reliability. High weaving speeds are not possible, and the useful life of the loom is very limited. The loom runs out-of-true and creates considerable noise.

10 In contrast hereto, the problem underlying the invention is to provide a needle ribbon loom which does not have the above-discussed disadvantages, but which on the contrary requires a minimum of maintenance and has a long useful life with high accuracy and reliability, and in which high weaving speed is possible with the development of very little noise.

Pursuant hereto, the present invention provides a needle ribbon loom having a reed drive, a weft insertion needle drive and a selvedge needle drive
20 which are each connected to a main driving shaft which

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extends transversely relative to the fabric web, the reed drive and the selvedge needle drive each being formed of pivoted linkages; and having a shedding drive comprising an auxiliary driving shaft driven
5 from the main driving shaft, characterised in that the weft insertion needle drive comprises respective pivoted linkage, and in that the weft needle drive and the reed drive each include respective rocking levers which are connected by way of respective connecting rods to
10 respective crankpins, offset by 180° , of the main driving shaft, so that the rocking levers of the weft insertion needle drive and the reed drive oscillate oppositely relative to one another.

Because the crankpins, at least for the reed drive,
15 weft needle drive and needle drive are arranged on a common shaft, to which in addition, (for example, by way of a single-stage worm and worm wheel gearing) the auxiliary driving shaft of the shedding drive is connected, the entire drive becomes more compact, easier to
20 inspect, less susceptible to trouble, more easily adjustable, more accurate and quieter. As a result of this design it is, furthermore, possible to achieve a

better mass equilibrium of the moving parts, so that vibration is reduced and higher speeds are possible, with low wear. The loom of the invention also has the advantage that, as a result of the coupling of the
5 individual drives to a main driving shaft, interference between the individual mechanisms is largely avoided. Thus, for example, vibrations produced by the action of the reed are not transmitted to other members, for example the weft needle.

10 The connecting of the auxiliary driving shaft of the shedding device to the main driving shaft prevents the loom from running backwards. Thus, weaving faults whilst stopping or starting of the loom are reduced.

The invention will be described further, by way of example, with reference to the accompanying schematic drawing, in which:-

Fig. 1 is a side view illustrating the drives
5 for a reed and for a weft insertion needle of a preferred needle ribbon loom of the invention; and

Fig. 2 is a side view of a selvedge insertion needle drive of the loom shown in Fig. 1.

The illustrated embodiment of loom of the
10 invention, as shown in the drawing, has a main driving shaft 2, to which a weft insertion needle drive 4, a reed drive 6, each comprising a pivoted linkage, and a shedding drive 8 are connected. Also shown are warp threads 10, a shed 12 and woven ribbon 14.

15 For the weft needle drive 4 and the reed drive 6, a common disc 16 is arranged on the main driving

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shaft 2. A crank arrangement carried by the disc 16 includes crankpins 18 and 20 which are at diametrically-opposite dispositions and therefore offset by 180° relative to one another. The
5 crankpins 18, 20 are mounted so as to be radially adjustable in respective grooves 22, so that their eccentricities can be varied. The crankpin 18 is associated with the linkage of the weft needle drive 4 and connects by way of a connecting rod 24 with a
10 rocking lever 26, which is pivotally connected, by way of a further connecting rod 28 to a further rocking lever 30. The lever 30 is fastened to a shaft 32 which carries and drives a weft needle 34. Pivots 36 and 38, by which the connecting rods 24 and
15 28 are fastened to the rocking lever 26, are fastened in respective slots 40 and 42 in the arms of the lever 26, whereby the effective lengths of the arms of the rocking lever 26 and therewith the stroke and the initial position of the weft needle 34 are adjustable.

20 The linkage of the reed drive 6 is connected to the crankpin 20 which is connected by way of a connecting rod 44 to a rocking lever 46 which carries a reed 48.

The rocking lever 46 has, at its lower end, a longitudinal slot 50 in which there is arranged, so as to be adjustable, a pivot 52 to which the connecting rod 44 is connected. Thus, adjustment
5 of the stroke and the position of the reed 48 is possible.

Furthermore, driven from the main driving shaft 2 by way of a single-stage gearing 54 is an auxiliary driving shaft 56 of the shedding drive 8.
10 The gearing 54 comprises a worm 58 which is arranged on the main driving shaft 2 and which co-operates with a worm wheel 60 which is fastened to the auxiliary driving shaft 56. The transmission ratio of the
15 worm wheel and is preferably 1:8. The auxiliary driving shaft 56 extends transversely to the main driving shaft 2, preferably at an angle of 90° . Fastened to the auxiliary driving shaft 56 are various eccentrics 62 which in known manner drive shafts (not
20 shown in more detail) of the shedding mechanism.

A selvedge needle drive 70 of the loom is shown in Fig. 2. Arranged on the main driving

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shaft 2 is a cam disc 72 on which runs a follower 74 mounted on one arm of a two-armed rocking lever 76. A spring 78 forces the follower 74 against the cam disc 72. Fastened to that end of the rocking 5 lever 76 which is remote from the follower 74 is a selvedge needle 80 which operates in known manner along one edge of the ribbon (not shown) being woven, and serves to lock in successive inserted weft loops.



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CLAIMS

1. A needle ribbon loom having a reed drive, a weft insertion needle drive and a selvedge needle drive which are each connected to a main driving shaft which extends transversely relative to the fabric web, the reed drive and the selvedge needle drive each being formed of pivoted linkages; and having a shedding drive comprising an auxiliary driving shaft driven from the main driving shaft, characterised in that the weft insertion needle drive comprises respective pivoted linkage, and in that the weft needle drive and the reed drive each include respective rocking levers which are connected by way of respective connecting rods to respective crankpins, offset by 180° , of the main driving shaft, so that the rocking levers of the weft insertion needle drive and the reed drive oscillate oppositely relative to one another.

2. A needle ribbon loom as claimed in claim 1, characterised in that the auxiliary driving shaft extends transversely to the main driving shaft and is driven from the latter by way of worm gearing.

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3. A needle ribbon loom as claimed in claim 1, characterised in that the eccentricity of the crankpins is adjustable.
4. A needle ribbon loom as claimed in claim 1,
- 5 characterised in that the effective lengths of the rocking levers are adjustable.
5. A needle ribbon loom as claimed in claim 4, characterised in that the rocking lever, driven by the main driving shaft, of the weft insertion needle
- 10 drive is coupled by way of a further connecting rod to a further rocking lever on a shaft of the weft insertion needle, the position of the point of application of the further connecting rod on the said rocking lever being adjustable.
- 15 6. A needle ribbon loom substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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