March 5, 1968 W. LIEBCHEN 3,371,688

DOUBLE WEFT THREAD PICKING MEANS FOR SHUTTLELESS LOOMS

Filed May 11, 1966 3 Sheets-Sheet 1

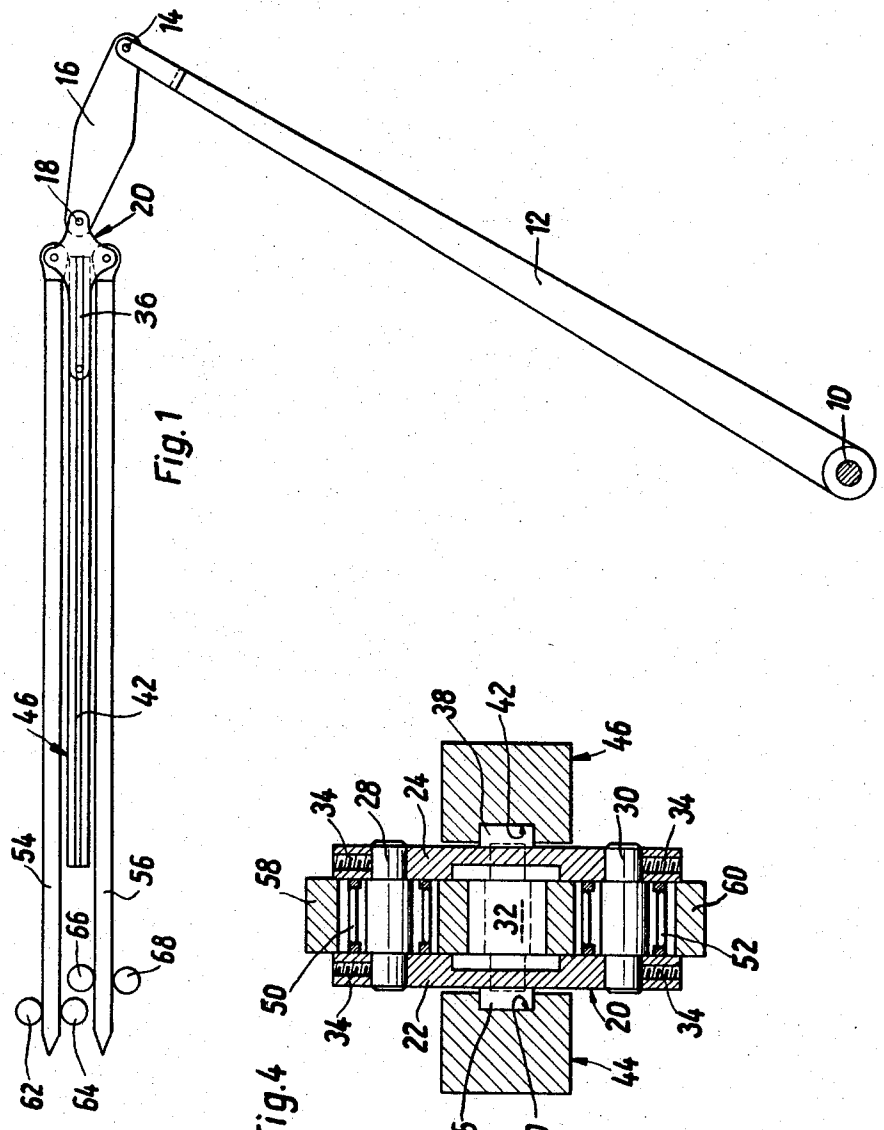

Fig. 1

Fig. 4

Inventor:
WALDEMAR LIEBCHEN
BY
Bailey, Stephens & Huettig
ATTORNEYS

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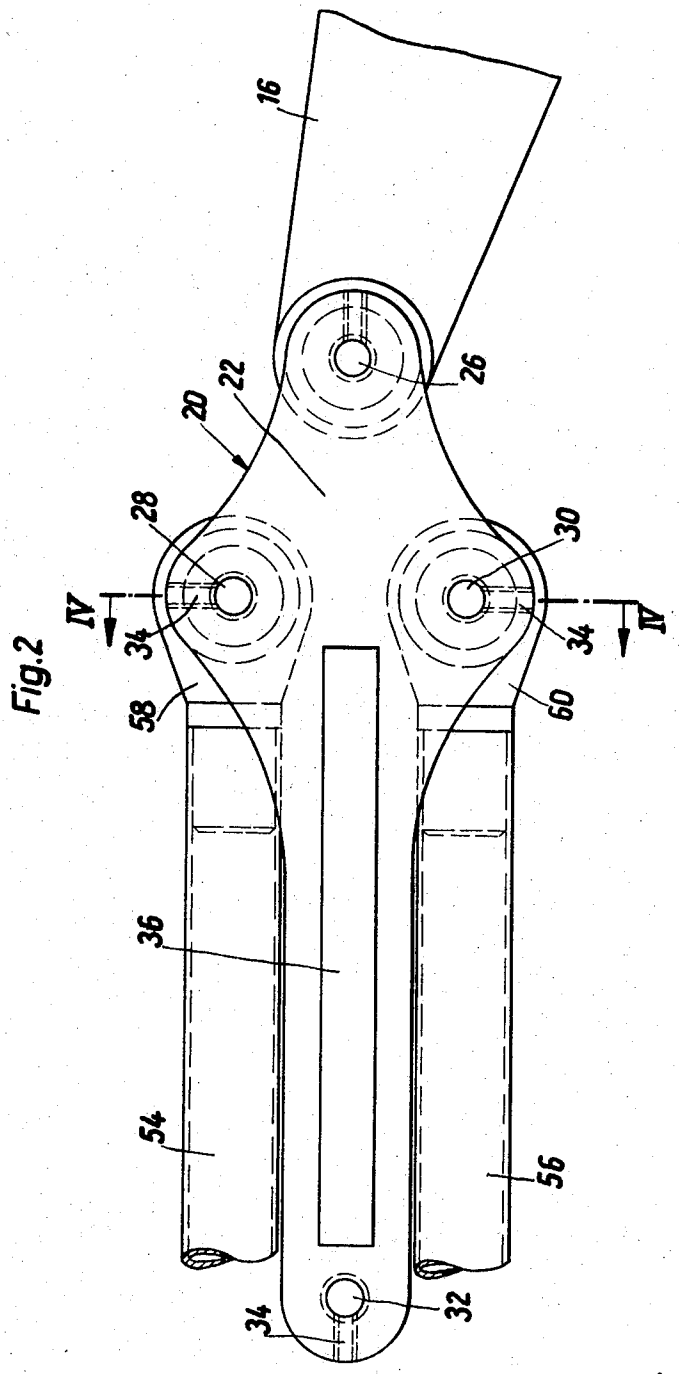

Fig.2

Inventor:
WALDEMAR LIEBCHEN
BY
Bailey, Stephens & Huettig
ATTORNEYS

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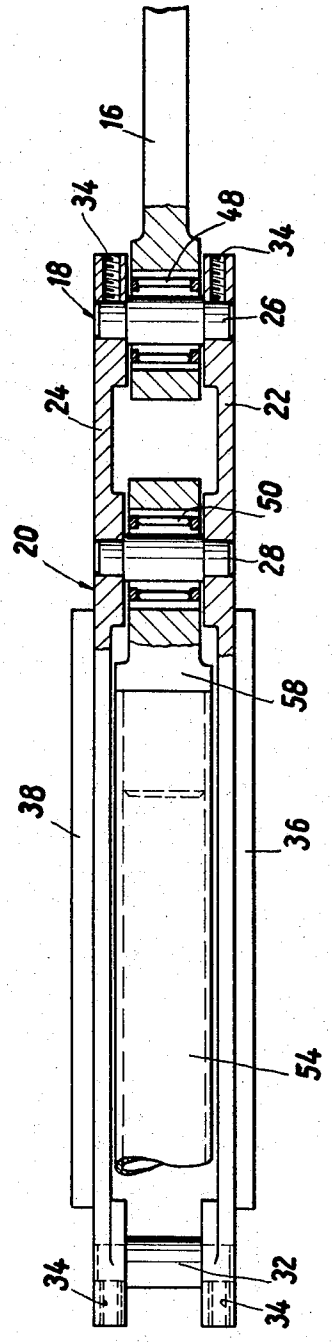

Fig.3

Inventor:
WALDEMAR LIEBCHEN
BY
Bailey, Stephens + Huettig
ATTORNEYS

United States Patent Office 3,371,688
Patented Mar. 5, 1968

3,371,688

DOUBLE WEFT THREAD PICKING MEANS FOR SHUTTLELESS LOOMS

Waldemar Liebchen, Grossostheim unter Aschaffenburg, Germany, assignor to Jean Gusken, Dulken, Rhineland, Germany

Filed May 11, 1966, Ser. No. 549,293
Claims priority, application Germany, May 11, 1965, G 43,562
7 Claims. (Cl. 139—123)

ABSTRACT OF THE DISCLOSURE

A shuttleless loom has, for the purpose of introducing threads simultaneously from the same side of the shed, carrier rods guided in pairs of rollers; the inner ends of the carrier rods are pivoted to a carrier body which is guided for sliding movement in a direction parallel to the length of the rods and is moved through a pivoted link by a swinging lever.

The invention relates to a shuttleless loom for pile fabrics with double weft thread picking using thread carriers which are introduced in pairs into the double shed from at least one side of the fabric being woven.

For the actuation of the individual carrier rods on one side of the fabric in shuttleless looms for conventional weaving, in an operation in which only one weft thread is picked in a single shed, it is known to impart the necessary movement to the rod by a link connected to an oscillating lever journalled in the plane of the swinging reed and moving in synchronism with the slay. The link converts the oscillatory motion of the lever to linear motion of the rod.

The use of this type of transmission of motion between driving lever and carrier rod in a shuttleless loom for pile fabrics with double weft thread picking by means of a pair of carriers introduced into a double shed, however, presents certain difficulties. The two carrier rods must be guided accurately enough to assure a proper transfer of the weft threads to the counter members. This suggests, in order to avoid different transverse forces on the carrier rods, the use of two links, which are substantially parallel to each other and are connected to the swinging driving lever at different distances from its pivot. The different radii of oscillation result in different picking movements and different speeds of movement for the two weft threads, which are undesirable for a number of reasons.

The primary object of the invention is to provide a shuttleless loom which overcomes these disadvantages, in which the two carriers are accurately guided in exactly similar paths in their movement into the sheds and in which, as a consequence, the operation of the machine is as efficient as possible, and the path of movement of the rods is reduced to a minimum.

According to the invention, this purpose is accomplished by mounting the carriers on the ends of two carrier rods arranged parallel to each other, which at points close to the web are reciprocably guided between pairs of rollers, while their ends remote from the web are pivotally connected to a guide body reciprocally movable in guide tracks or grooves parallel to the carrier rods, the guide body being movable by a conventional oscillating lever through a link connection.

Further objects and advantages of the invention will appear more fully from the following description, especially when taken in conjunction with the accompanying drawings which form a part thereof.

In the drawings:

FIG. 1 shows in side elevation a mechanism according to the invention with the nearer guide member cut away;

FIG. 2 is an enlargement of a part of FIG. 1;

FIG. 3 is a top plan view of a part of FIG. 1, with parts in section; and

FIG. 4 is a cross-section on the line 4—4 of FIG. 2.

FIG. 1 shows a lever **12** swingable about an axis **10** perpendicular to the slay, which in a conventional way is reciprocated in synchronism with the slay from side to side of a generally vertical mid-position. A link **16** is connected to the lever **12** by a pin **14**, and the link is further connected at **26**, to a guide body **20**, the lever **12** thus transmitting motion to the guide body.

The guide body **20** is formed by two plates **22** and **24** arranged parallel to each other and provided with aligned holes, the plates being held spaced apart by bolts **26**, **28**, **30**, **32**; the bolts having reduced end portions. The bolts are fastened in the plates by set crews threaded in the bores **34**, and provided with rounded ends which engage in grooves or depressions in the reduced end portions of the bolts.

The plates **22**, **24** carry on their outer faces splines **36**, **38**, which are slidable in grooves **40**, **42** in guide members **44**, **46** positioned on both sides of the plates. The guide members **44**, **46** extend in a direction transverse to the fabric being woven, approximately in the mid-point between the two sheds, and are fastened on the slay or the machine frame.

The bolt **26** carries a needle bearing **48**, by means of which the link **16** is swingably held between the plates **22**, **24**. The bolts **28**, **30** similarly carry needle bearings **50**, **52** by means of which the inner ends of two carrier rods **54**, **56** with end portions provided with eyes are pivoted on the guide body **20**.

At a point directly in front of the entrance into the shed are two pairs of rollers **62**, **64** and **66**, **68** between which the outer ends of the carrier rods are guided. The rollers being freely journalled on the slay or the machine frame, whichever carries the guide members **44**, **46**. The guide roller axes are perpendicular to the direction of the grooves **40**, **42**, so that the carrier rods during swinging of the lever **12** remain absolutely parallel to each other in all positions. This assures that carrier rods move parallel to each other into the web and the transfer of the weft threads is accomplished without difficulty. In addition, the friction in the arrangement of the invention is quite low, because sliding friction is present only between the splines and the groove surfaces of the guide and the rolling friction between the carrier rods and the rolls is so small that it can be disregarded. The increase in power required for moving the carrier rods as compared with the power required in a conventional machine having only a single carrier rod on each side of the web is consequently determined practically only by the increase in mass of the two carrier rods and the guide body; in which connection it should be borne in mind that the use of two links is avoided.

The guide members in which the guide body is mounted is located between first and second horizontal planes which contain the axes of the pivots of the carrier rods and the longitudinal axes of the carrier rods, and are symmetrical with respect to a third plane equidistant from the first and second planes.

While I have described herein one embodiment of my invention, I wish it to be understood that I do not intend to limit myself thereby except within the scope of the claims hereto or hereinafter appended.

I claim:

1. An arrangement for use in a shuttleless loom for weaving pile fabric, for introducing simultaneously two weft threads from the same side into a shed, comprising two parallel thread carrier rods, two pairs of rollers

mounted to rotate freely about parallel axes substantially perpendicular to the longitudinal axes of the carrier rods, one of the carrier rods fitting between the rollers of each of the pairs, a guide body, means pivoting the inner ends of the carrier rods to the guide body, means mounting the guide body for sliding movement in a direction parallel to the longitudinal axes of the carrier rods, a lever mounted to swing about an axis, and a link pivoted to the lever and to the guide body.

2. In an arrangement as claimed in claim 1, said guide body mounting means comprising guide members located between first and second planes containing the axes of said pivoting means and the longitudinal axes of the rods.

3. In an arrangement as claimed in claim 2, said link being pivoted to said guide body about an axis lying in a third plane parallel to and intermediate between said first and second planes.

4. In an arrangement as claimed in claim 3, said third plane being equidistant from the first and second planes, and said guide members being symmetrical with respect to said third plane.

5. In an arrangement as claimed in claim 1, said guide body mounting means comprising guide members on each

side of the guide body having grooves therein extending parallel to the longitudinal axes of the carrier rods, said guide body having splines slidably engaged in said grooves.

6. In an arrangement as claimed in claim 5, said guide body comprising spaced parallel plates, said splines being mounted on the outer faces of the plates, bolts extending between the plates, said carrier rods and said link having portions located between the plates pivoted on said bolts.

7. In an arrangement as claimed in claim 1, said guide body comprising spaced parallel plates, bolts extending between the plates, said carrier rods and said link having portions located between the plates pivoted on said bolts.

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HENRY S. JAUDON, *Primary Examiner.*