

[54] MEASURING APPARATUS

3,552,622 1/1971 Fransen 139/122 H

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[57] **ABSTRACT**

[52] U.S. Cl. **139/122**

[51] Int. Cl. **D03d 47/34**

[58] Field of Search 139/122 R, 122 H, 127 P; 226/178, 184; 66/132

Weft yarn measuring apparatus for delivering a given length of weft yarn to a shuttle-less loom comprising feed rolls in contact at their periphery forming a nip and means for introducing yarn into the nip while the rolls are rotating.

[56] **References Cited**

UNITED STATES PATENTS

3,140,633 6/1964 Vincent 139/127 P

8 Claims, 2 Drawing Figures

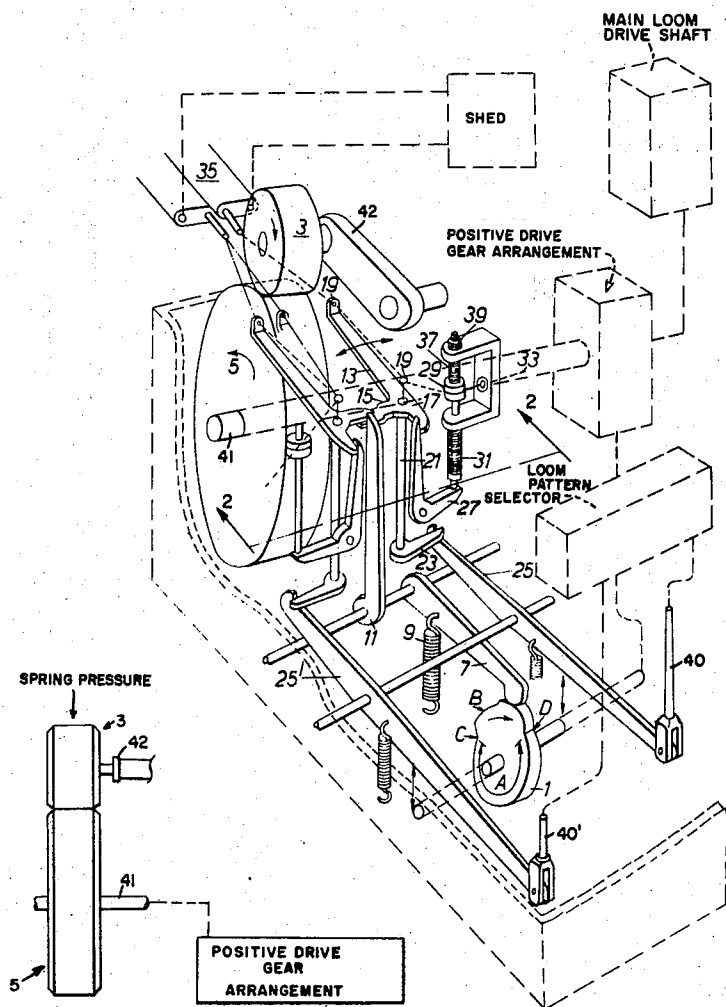


Fig. 1.

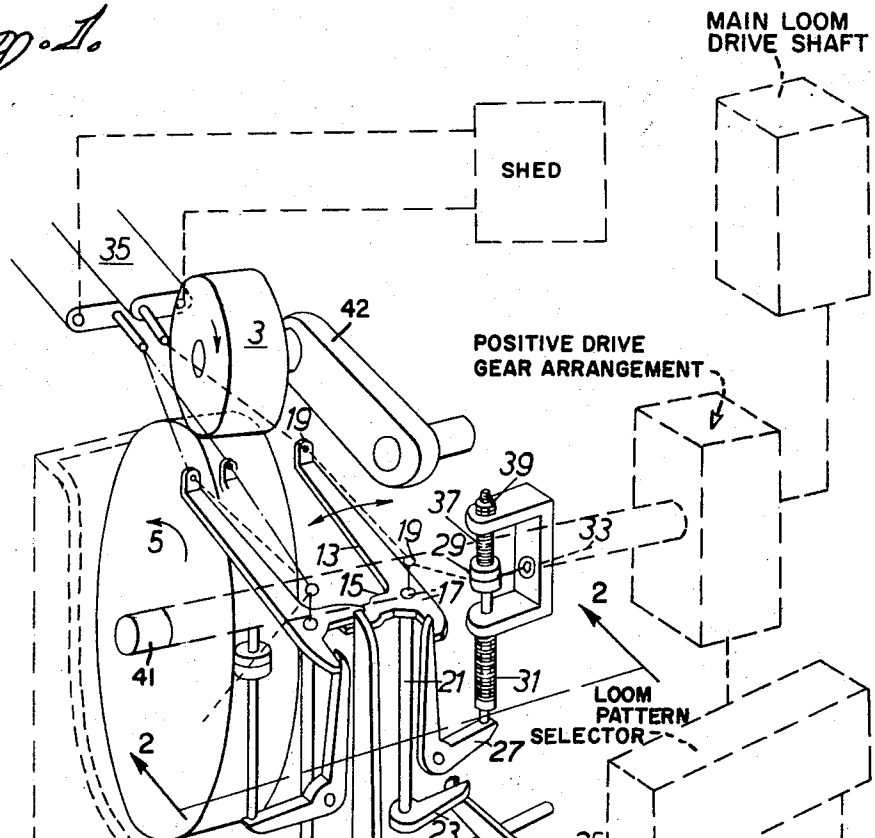
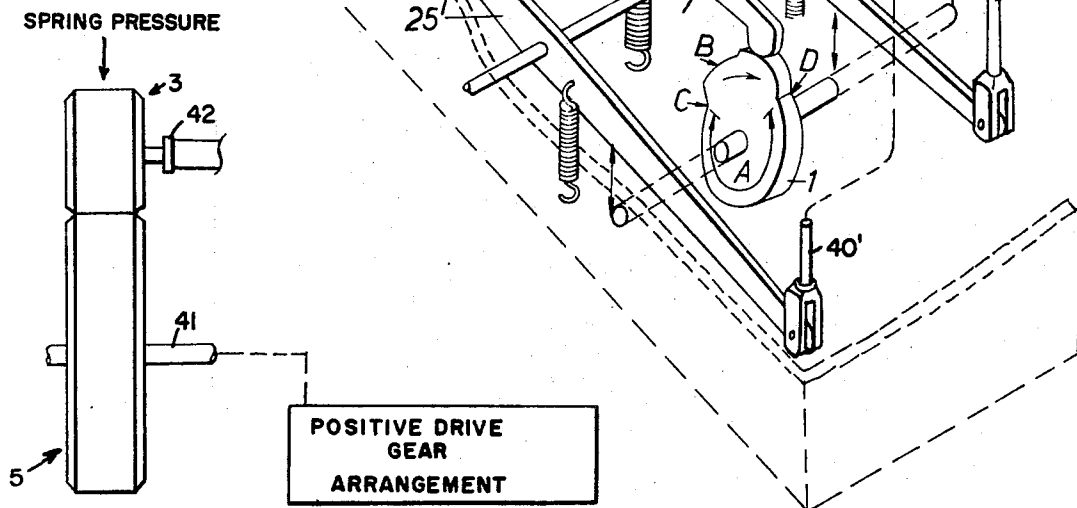


Fig. 2.



MEASURING APPARATUS

The present invention relates to weft yarn measuring apparatus for use in combination with shuttle-less looms, for example, water or air (fluid) jet looms.

The applicants use the expression "yarn" to mean any filamentary structure whether derived from staple or continuous filaments.

According to the present invention there is provided a weft yarn measuring apparatus for delivering a given length of weft yarn to a shuttle-less loom comprising two feed rolls in contact at their periphery forming a nip and means for introducing the yarn into the nip from a position substantially at right angles to the subsequent direction of travel of the yarn while the rolls are rotating so that the yarn is advanced by the rolls until removed from the nip.

To facilitate the insertion of the yarn into the nip of the feed rolls, one or both of the rolls may be bevelled at its periphery.

An apparatus embodying the present invention will now be described by way of example only with reference to the accompanying drawings, wherein FIG. 1 is a perspective view of a weft yarn measuring apparatus attachment to a loom according to the teachings of the present invention, and FIG. 2 is an end view of the bevelled peripheries of the feed rolls of the present invention taken along lines 2-2 of FIG. 1.

A suitably profiled cam 1 is synchronously connected to the loom mechanism for determining both the point of and maximum duration for yarn selection, and length of yarn to be advanced by the feed rolls 3 and 5. A cam follower 7 which bears against the cam under the influence of a spring 9 effects the movement of a single armed lever 11 which in turn engages with one arm 15 of a bifurcate guide lever 13. The guide lever carries yarn guide eyes 19 and is pivoted so as to move in a substantially horizontal plane at one end of a vertically disposed rod 21. At the other end of the rod is a single armed lever 23 which is urged through a bell crank lever 27 by a gripper spring 31 to engage with a rocker arm 25 responsive to actuation via cables 40, 40' from a conventional loom pattern selector as indicated by arrows. The bell crank lever 27 also controls the action of a yarn gripper 29 as described below.

In operation from the position shown the rocker arm 25 is moved by the pattern selector to disengage from lever 23 after rotation of the cam in the direction shown to position B. Movement of the cam to this position also permits the guide lever 13 to move inwards slightly but the yarn 33 is not yet released by the gripper 29 despite the opening of the gripper spring 31 to rotate the rod 21, due to the simultaneous opening of the follow-up spring 37. When the cam moves to position C lever 11 is drawn further back which allows the lever 13 to continue its movement under the influence of spring 31 to bring the yarn 33 into the nip of the rolls 3 and 5. At the same time the opening of the follow-up spring ceases and the gripper 29 opens to permit the yarn to be advanced by the feed rolls once it engages therewith. The opening of the follow-up spring may be conveniently limited by lock nuts 39. Thus yarn may be fed to a yarn store such as a vacuum suction tube 35 as may be employed in a so-called water jet loom.

Yarn is removed from the nip of the feed rolls in the

reverse manner when the cam reaches position D. Thus, for a given feed roll speed the distance A on the cam determines the length of yarn which is advanced by the rolls.

Clearly only one of the two feed rolls need be positively driven and in the present apparatus shaft 41 of roll 5 is driven from the loom mechanism through an appropriate gear arrangement (not shown) while roll 3 is suitably urged to contact roll 5 via spring biased link 42.

As shown, the apparatus is duplicated in certain parts so that two yarns may separately be advanced by the feed rolls depending upon the actuation of rocker arms 25 or 25'. Such a situation arises when, for example, two weft yarns differing in some characteristic such as colour or dyeability are to be made available for introduction into the warp shed.

By employing more than one of the devices as illustrated, a number of different yarns may similarly be made available, and in this respect reference is made to copending U.S. application Ser. No. 264,401 of Ormerod filed June 19, 1972 which clearly discloses weft yarn insertion apparatus with which the apparatus of the present invention may be used.

We claim:

1. Weft yarn measuring apparatus for delivering a given length of weft yarn to the yarn store of a shuttle-less loom at a given speed comprising two feed rolls in contact at their periphery forming a nip and means for introducing the yarn into the nip from a position substantially at right angles to the subsequent direction of travel of the yarn while the rolls are rotating and for withdrawing the yarn from the nip so that the yarn is advanced by the rolls until removed from the nip.
2. Apparatus as claimed in claim 1 in which at least one of the feed rolls is bevelled at its periphery.
3. Apparatus as claimed in claims 1 in which at least one of the feed rolls is positively driven.
4. Apparatus as claimed in claim 1 in combination with weft yarn insertion apparatus.
5. Apparatus as in claim 1 in combination with a shuttle-less loom.
6. Apparatus as in claim 5 wherein the shuttle-less loom is a fluid-jet loom.
7. In combination, a yarn store device of a shuttle-less loom; and means for feeding discrete lengths of yarn to the yarn store device, said means comprising a yarn guide in contact with a yarn extending into the yarn store device, two feed rolls in contact at their peripheries forming a nip, at least one of said rolls being driven at a given speed in a direction to feed a yarn in the nip to the yarn store device, and means for moving the yarn guide between one position in which the yarn is introduced into the nip from a position substantially at right angles to the direction of travel of the yarn and another position in which the yarn lies outside the nip so that the yarn is advanced at a given speed by the rolls only when the yarn is engaged by the nip.
8. Apparatus as in claim 7 including yarn gripping means synchronized with the yarn guide for gripping the yarn upstream of the yarn guide when the yarn lies outside the nip and for releasing the yarn when the yarn is introduced into the nip.

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