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(54) Apparatus and method for properly knotting the threads being wound on a beam for forming a new warp arrangement with the corresponding threads of an exhausted warp on a textile loom.

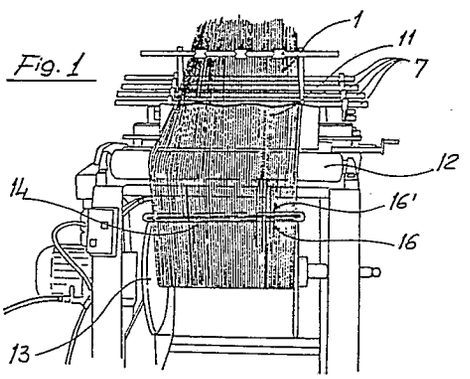
(57) There is disclosed an essentially electromechanical apparatus,adapted to be applied to sizing machines or beam joining machines,adapted to allow for the even and odd threads wound on a collecting beam to be properly separated or sorted.

This apparatus comprises a comb (1) consisting of shaped teeth and a bearing frame which supports horizontal rods (7) to be raised in a programmed way.

These rods are provided in a number equal to that of the beams for supplying the threads (10) to be joined,which are arranged upstream of the bearing frame.

The threads of each supplying beam slide on a corresponding rod,whilst the comb (1) is able of reciprocating in its laying plane,the comb being so designed as to be able of engaging the threads as sequentially raised and supported by the rods (7).

Fig. 1



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Description

APPARATUS AND METHOD FOR PROPERLY KNOTTING THE THREADS BEING WOUND ON A BEAM FOR FORMING A NEW WARP ARRANGEMENT WITH THE CORRESPONDING THREADS OF AN EXHAUSTED WARP ON A TEXTILE LOOM

BACKGROUND OF THE INVENTION

The present invention relates to an apparatus and method for properly knotting the threads being wound on a beam for forming a new warp arrangement with the corresponding threads of an exhausted warp on a textile loom.

As is known,as a warp beam loaded on a textile loom has been exhausted, the tail portions of the remaining threads are to be tied or knotted to corresponding threads of a new warp beam,in order to assure continuity to the fabric being made.

Also known is the fact that in fractional-warp beams is presently practically impossible to knot the warp threads with the proper operating sequence.

This impossibility causes a consequent undesired crossing and breakage of the threads,because of an impact against the textile loom blades :because of this the textile loom must be frequently shut off.

SUMMARY OF THE INVENTION

Accordingly,the task of the present invention is to overcome the above mentioned drawbacks,by providing an apparatus,to be applied to seizing machines or fractional beam joining machines which affords the possi bility of sorting the starting and end portion of the even and odd threads wound on a warp beam.

Within the scope of the above mentioned task, a main object of the present invention is to provide such an apparatus,for application to seizing and the like machines,which is able of completely automatically operating.

Another object of the present invention is to provide such an apparatus which is very simple construction wise and very reliable in operation.

According to one aspect of the present invention,the above mentioned task and objects,as well as yet other objects,which will become more apparent hereinafter,are achieved by an apparatus and method for properly knotting the threads being wound on a beam for forming a new warp arrangement with the corresponding threads of an exhausted warp on a textile loom,characterized in that said apparatus essentially comprises a comb,consisting of shaped teeth and a bearing frame supporting horizontal rods,adapted to be raised in a programmed way, the number of said rods being equal to that of the beams arranged upstream of said bearing frame and supplying the threads to be joined,the threads of each said supplying beam sliding on a corresponding said rod, said comb being able of reciprocating in its laying plane and being so designed as to either restrain or not,depending on its relative position,the threads which are supported and raised by said rods.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the apparatus and method according to the present invention will become more apparent hereinafter from the following detailed description of a preferred embodiment thereof,which is illustrated,by way of an indicative but not limitative example,in the figures of the accompanying drawings,where:

figure 1 is a schematic front view illustrating an apparatus according to a preferred embodiment of the present invention;

figure 2 is another schematic view illustrating the stand supporting the beams supplying the threads to be joined;

figure 3 illustrates the rods each of which supports the thread set supplied by one of said beams, as well as means for the translation of the rods in vertical planes;

figures 4 and 5 show the mentioned thread sets with the rods in a lowered and raised position respectively;

figure 6 shows a possible procedure for separating even threads from odd threads; and

figure 7 is a detail view illustrating the comb member for sorting the threads.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures of the accompanying drawings,the apparatus according to the present invention essentially comprises a comb 1,or "sorting" comb,consisting of a plurality of teeth able of smoothly translating with respect to one another,so as to define gaps fitting the diameter of the threads to be processed.

More specifically,these teeth consists of corresponding reed members which are helically coupled to a worm screw-having opposite thread portions and a variable pitch-and provided,at the intermediate portion thereof 2,with a downwardly diverging tab.

The thus constructed comb is mounted on a slide 3 which is able of reciprocating as driven by a pair of hydraulic or pneumatic cylinders 4.

Upstream of the comb 1 there is provided a framework 5,supporting double-acting cylinders 6 which are able of upwardly and downwardly displacing,with a parallel relationship,corresponding horizontally extending rods 7.

Upstream of the mentioned framework there is arranged a supporting stand 8 which supports a plurality of beams 9 which supply the threads to be joined, indicated overally at the reference number 10,and the number of which is equal to that of the above mentioned rods 7.

In this connection it should be pointed out that the thread set unwound from each single beam are caused to pass on a corresponding rod,as is illustratively shown in figure 3.

Downstream of the mentioned expansion comb there are provided a pantograph comb member 11,a transmission cylinder 12 and a beam 13 for fractionally winding the fractional warp 14.

The apparatus further comprises a central control unit including the power supply circuits and a storage processor adapted to control the raising movement sequence of the rods 7.

The subject apparatus,moreover,is so designed and arranged as to hold the thread tension absolutely constant both in the warp forming step and in the beam wound step.

In operation,after having thread loaded the sorting comb 1 and the front pantograph comb 2,the operating program is selected by storing,on a suitable keypad,the number of the thread supplying beams 9 provided for forming the warp by means of a fractional system.

Then,upon pressing a preset push-button on the panel 15,the thread sorting operation is started which provides for the sequential raising,from upstream to downstream,of the rods 7,with a corresponding reciprocating movement of the sorting comb,which occurs after the upwardly translation of each rod.

Thus,the translation movements of the sorting comb,cause the thread set of each supplying beam to be alternately restrained by the reed or tab members formed at the intermediate portion of said comb and released to slide upwardly.

At the end of this operation cycle,an adhesive strip 16 or the like is introduced into the mouth portion defined by the two thread sets,so as to lock all of the threads at a lowered position.

After having carried out the above mentioned step,all of the rods are caused to lower by operating another push-button.

Then a new operating cycle is started in which, by reversing the movement sequence of the sorting comb,the threads which were arranged in a lowered position are brought to a raised position and vice versa.

Then on the lowered threads there is applied an adhesive strip 16′ so as to mutually restrain these threads,and then the rods 7 are lowered again.

This method,in actual practice,affords the possibility of precisely sorting or separating the warp forming even and odd threads,thereby affording the possibility of properly knotting the end portions of the threads of the exhausted beam and the starting portions of the threads of a new beam.

In particular,the very reduced operating times of this method (the raising of each rod is carried out in 6-8 seconds) afford the possibility of applying the apparatus according to the present invention to cotton sizing machines so as to greatly reduce the machine setting time.

Moreover,since the subject method is completely autotamic,it does not require additional operators.

As a feature of the invention,it should be also mentioned the fact that,since the sorting comb is of the expansion type,it can be adjusted for a broad range of thread diameters :moreover, the provision of a single sorting comb provides the operator with an easy access capability.

While the invention has been disclosed and illustrated with reference to a preferred embodiment thereof,it should be apparent that the disclosed embodiment is susceptible to several modifications and variations,all of which will come within the spirit and scope of the invention,as defined in the accompanying claims.

Claims

1- An apparatus for properly knotting the threads being wound on a beam for forming a new warp arrangement with the corresponding threads of an exhausted warp on a textile loom,characterized in that said apparatus comprises a comb,consisiting of shaped teeth and a bearing frame supporting horizontal rods, adapted to be raised in a programmed way,the number of said rods being equal to that of the beams arranged upstream of said bearing frame and supplying the threads to be joined,the threads of each said supplying beam sliding on a corresponding said rod,said comb being able of reciprocating in its laying plane and being so designed as to either restrain or not,depending on its relative position,the threads which are supported and raised by said rods.

2- An apparatus according to claim 1,characterized in that said comb consists of a given number of teeth able of translating evenly with respect to one another so as to define gaps related to the diameters of the threads being engaged therein,said teeth comprising reed members helically coupled to a worm screw-with opposite thread portions and a variable pitch-and being provided,at the intermediate portion thereof, with a respective downwardly diverging tab.

3- An apparatus according to the preceding claims, characterized in that said comb is mounted on a slide adapted to be reciprocated by means of a pair of actuating cylinders.

4- An apparatus,according to one or more of the preceding claims,characterised in that upstream of said comb there is provided a framework supporting double-acting cylinders adapted to upwardly and downwardly reciprocate said horizontal rods.

5- An apparatus according to one or more of the preceding claims,characterized in that upstream of said framework there is arranged a stand supporting a plurality of beams supplying the threads to be joined, the number of said beams being equal to that of said horizontal rods,the thread set unwound from each said beam being caused to pass on a corresponding said horizontal rod.

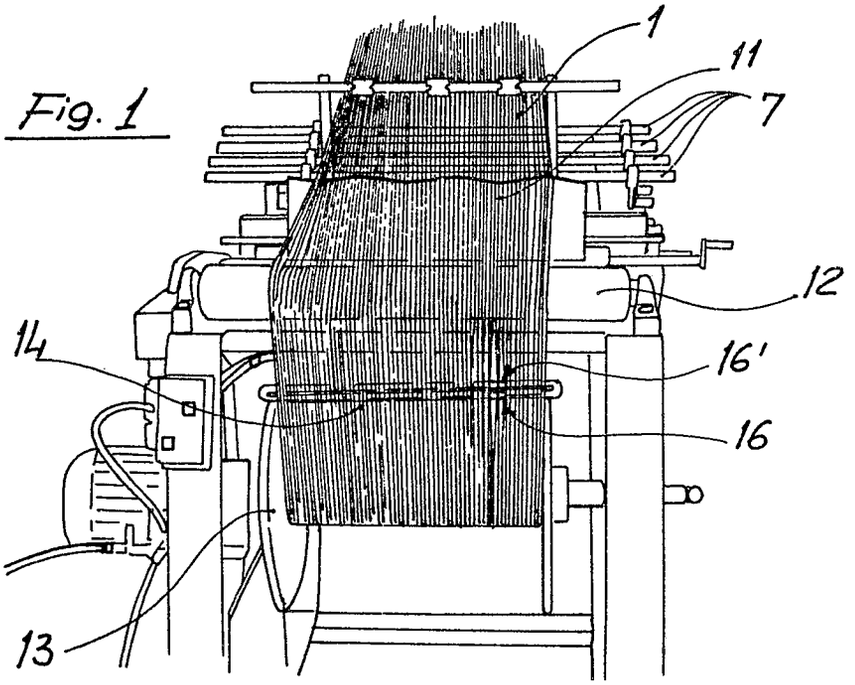
6- An apparatus according to one or more of the preceding claims,characterized in

that,downstream of said comb, there are provided a pantograph comb,a transmission cylinder and a fractional warp winding beam.

7- An apparatus according to one or more of the preceding claims,characterized in that said apparatus further comprises a central control unit including the power supply circuits and a storage processor adapted to control the displacements of said horizontal rods.

8- An apparatus according to one or more of the preceding claims,characterized in that it comprises means for holding the tension on said threads constant both during the warp forming a step and during the beam winding step.

Fig. 1



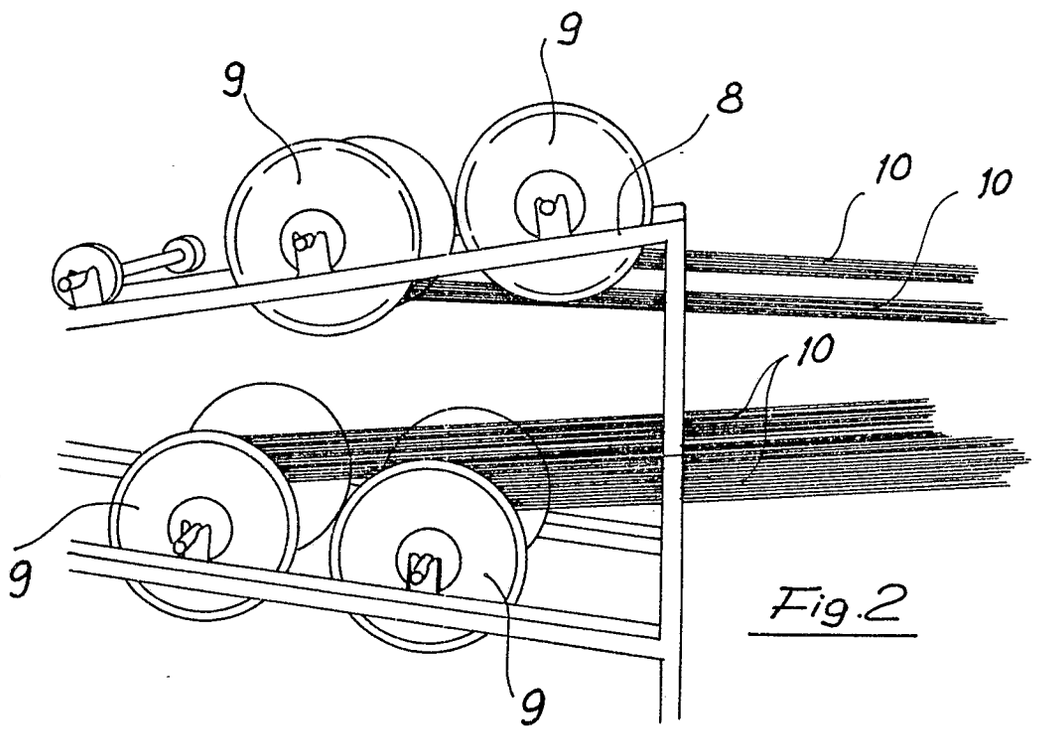


Fig. 2

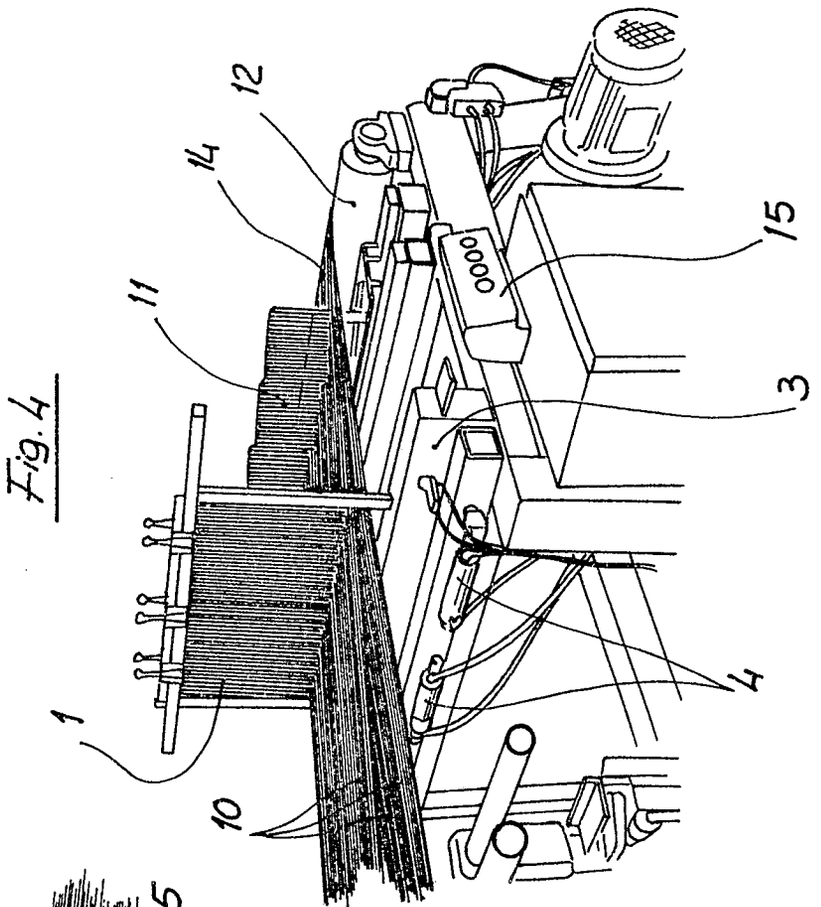


Fig. 4

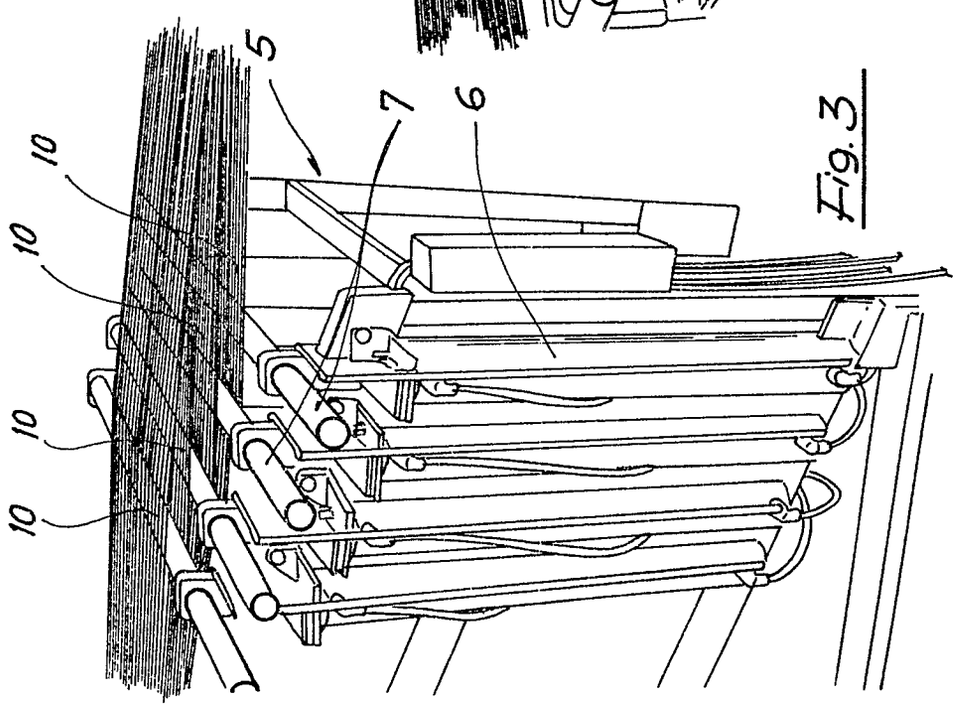


Fig. 3

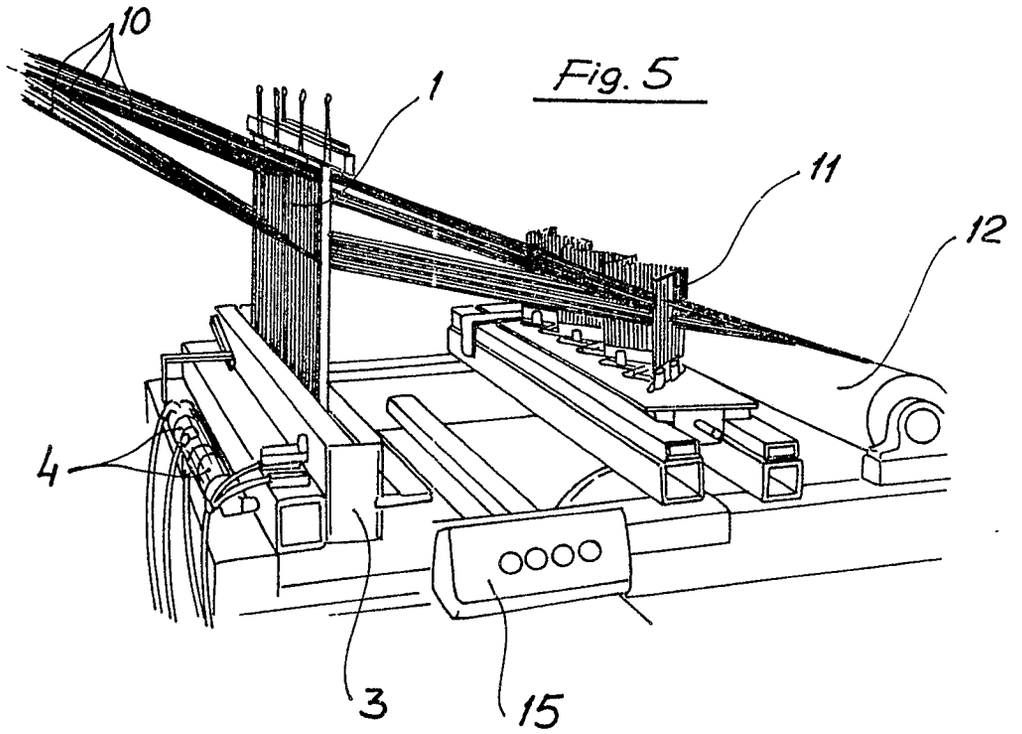


Fig. 5

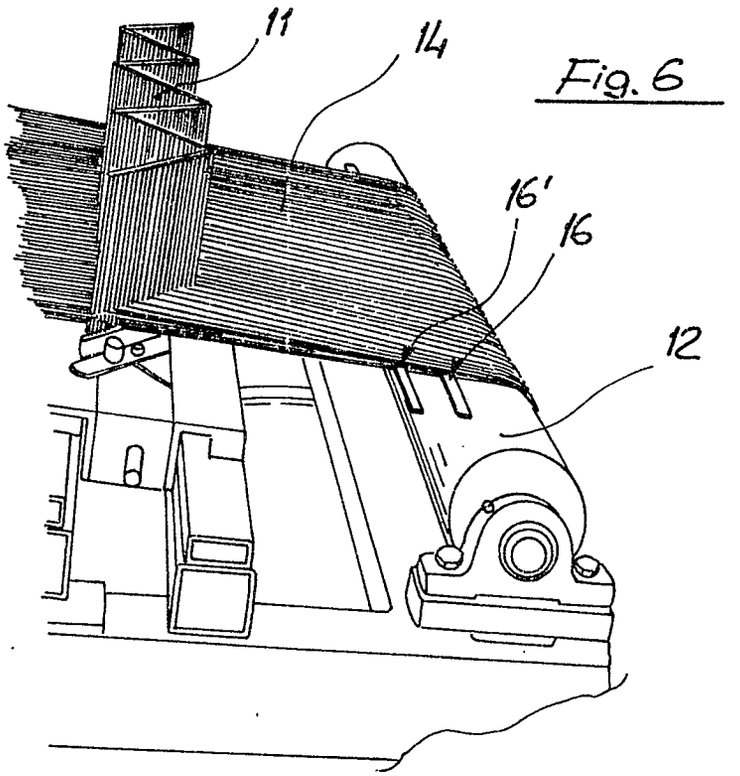
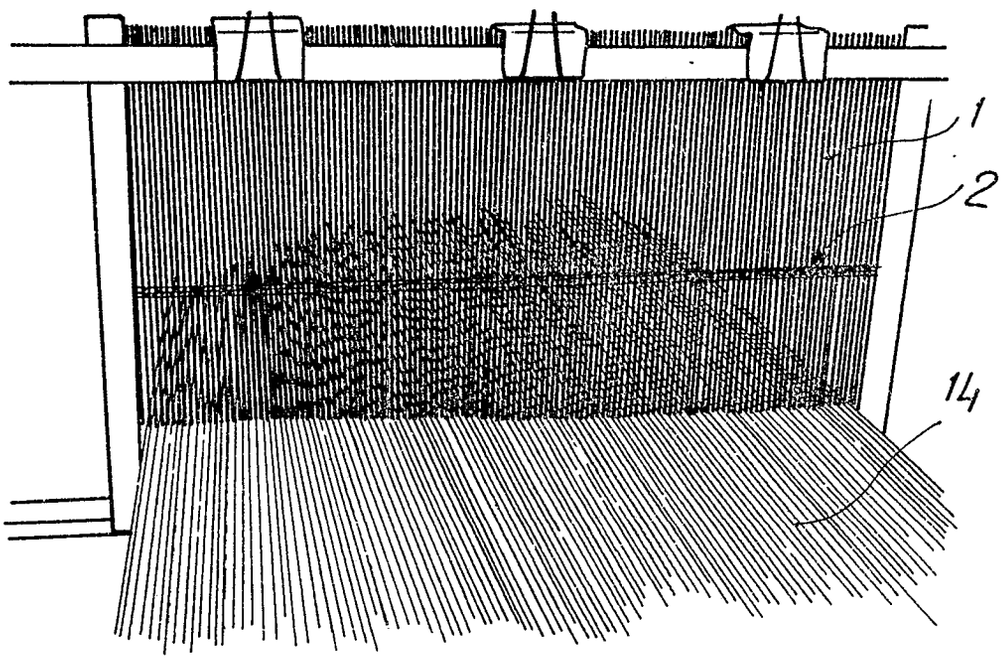


Fig. 6

Fig. 7



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DECLARATION

which under Rule 45 of the European Patent Convention shall be considered, for the purpose of subsequent proceedings, as the European search report

Application number

EP 89 83 0002

The Search Division considers that the present European patent application does not comply with the provisions of the European Patent Convention to such an extent that it is not possible to carry out a meaningful search into the state of the art on the basis of all claims.
Reason:

The matter for which protection is sought is not clearly defined in the claims.
Description and drawings do not disclose the invention in a way the solution can be understood.
Meaningful search impossible.

CLASSIFICATION OF THE APPLICATION (Int. Cl.4)

D 03 J 1/18

Place of search	Date of completion of the search	Examiner
The Hague	03-05-1989	BOUTELEGIER