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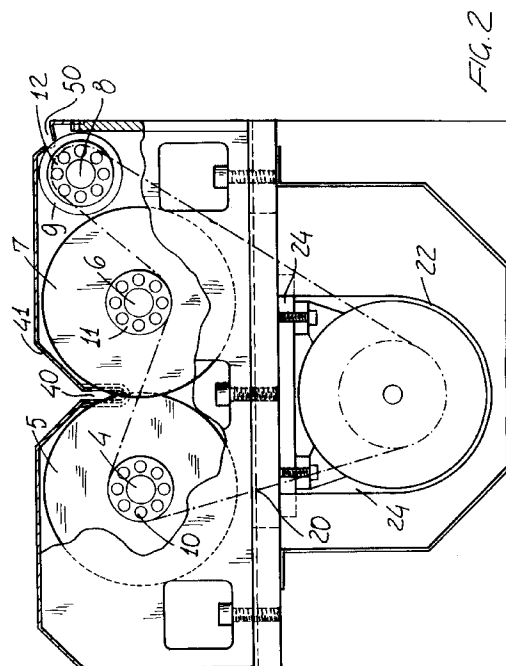
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(54) **Improved apparatus for grinding and sharpening blades in general.**

(57) The present invention relates to an improved machine for grinding and sharpening blades in general, characterized in that the machine comprises a bearing framework, which is provided with a front plate and a rear plate, supporting the rotary shaft of at least a pair of grinding wheels (5,7), arranged adjoining one another, driving means (22) being moreover provided, of the toothed belt (20) type, for turning in opposite rotaty directions the grinding wheels.



BACKGROUND OF THE INVENTION

The present invention relates to an improved machine for grinding and sharpening blades in general.

As is known, there are at present commercially available several machines for sharpening blades in general, which machines substantially comprise a pair of counter-rotating grinding wheels, therebetween the blade to be sharpened is arranged.

These prior machines, however, have the main drawback that they are of a comparatively large size and of complex operation and, moreover, they are rather noisy.

Because of the above mentioned reasons, these prior art machines can not be directly used by users who, because of working requirements, must use blades which must be frequently re-sharpened.

Another drawback of these prior machines is that their grinding wheels are conventionally supported by bearing shafts which are connected to the machine bearing framework at one end portion only.

In particular, the bearing shafts are cantilever-wise supported and, accordingly, they can be subjected to objectionable clearances which, in addition to providing a poor quality sharpening of the blades, can generate vibrations susceptible to further increase the operating noise of the machine.

Yet another drawback is that the prior machines require, after the sharpening step in which the blade cutting edge is recovered, a subsequent and separated grinding step, for removing burrs and dead edge portions of the blade.

SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks, by providing an improved machine for grinding and sharpening blades in general, which allows to carry out these two working operations, i.e. the grinding and sharpening operations, by a single processing step, thereby greatly reducing the processing time on the blade.

Within the scope of the above aim, a main object of the present invention is to provide such an improved machine which can be used very easily and in particular by those users which must frequently grind and sharpen their operating blades.

Another object of the present invention is to provide such a machine which is practically noise free and very reliable in operation and which, moreover, can be easily made starting from easily available elements and materials and which, accordingly, is very competitive from a mere economic standpoint.

According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by an improved machine for grinding and sharpening blades in general, character-

ized in that said machine comprises a bearing framework, which is provided with a front plate and a rear plate, supporting the rotary shaft of a pair of grinding wheels, arranged adjoining one another and between said plates, tooth belt driving means being moreover provided for causing said grinding wheels to turn in opposite turning directions.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the invention will become more apparent from the following detailed disclosure of a preferred, though not exclusive, embodiment thereof, which is illustrated, exclusively by way of an indicative but not limitative example, in the accompanying drawings, where:

Figure 1 is a perspective schematic view illustrating the grinding and sharpening machine according to the present invention;

Figure 2 is a cross-sectional and front elevation view of the subject machine;

Figure 3 is a further cross-sectional view of the machine according to the invention, substantially taken through a horizontal plane; and

Figure 4 is a top plan view of a possible arrangement of the grinding wheels included in the machine according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the number references of the figures of the accompanying drawings, the improved machine for grinding and sharpening blades in general, according to the present invention, comprises a bearing framework, generally indicated at the reference number 1, which comprises a front plate 2 and a rear plate 3 which are mutually parallel and spaced.

The plates 2 and 3 support, through ball bearings, a first shaft 4 for supporting a first grinding wheel 5 and a second supporting shaft 6, for supporting a second grinding wheel 7.

Moreover, there is provided a third supporting shaft 8, supporting an auxiliary grinding wheel 9, provided for sharpening scissors and the like, as it will become more apparent hereinafter.

The shafts 4, 6 and 8 are mutually parallel, and the grinding wheels are arranged between the plates 2 and 3, and they, accordingly, are connected to shafts which are affixed at both the end portions thereof, and, accordingly, the grinding wheels will be caused to turn in a very reliable way.

To the first shaft 4 there is connected a first toothed pulley 10 and to the second shaft there is connected a second toothed pulley 11, whereas to the third shaft 8 there is connected a transmission toothed pulley 12.

Through the mentioned pulleys there is entrained

a toothed belt 20 which engages the pulleys 10 and 11 so as to cause the related supporting shafts to be rotated in opposite rotary directions.

More specifically, the toothed belt 20 is driven by a driving gear wheel 21 which is connected to a driving assembly 22, supported by a slide plate 24 having elongated slots 25 allowing the position of the driving assembly to be changed, so as to also operate as a tension assembly for the belt.

The grinding wheels 5 and 7 are advantageously provided with helical tooth arrangements 30, equispaced from one another, so as to provide a mutual crossing at their mutual connection region, in order to define a precise sharpening region which is arranged at a notch 40 provided on a guiding plate 41 so as to provide a precise and accurate location of the blade to be sharpened.

The grinding wheels 5 and 7 are provided, at their axial end portions, with rounded parts 42, on the corner of the threads at the burrs, so as to prevent any processing defects from occurring.

The grinding wheels, which have a helical contour or, if desired, a flat contour, are coated by a diamond powder, or by like coating substances, in particular those which are commercially available with the trade name of Borazon.

In this connection it should be moreover pointed out that the guiding plate 41 is provided, at the auxiliary grinding wheel 9, with a guiding recess 50, allowing to properly locate scissors blades or the like.

With the disclosed arrangement, there is provided an improved machine which allows to perform both the sharpening operation, with a removal of the burrs and the dead edge of the blades, and the re-sharpening of old blades, which have lost their cutting edge, thereby providing a new cutting edge and removing the related processing burrs.

Moreover, the machine according to the invention, which can be used in a very simple manner, is practically free of any noise owing to the provision of the toothed belts which allows to perform a very accurate sharpening, in particular owing to the proper location of the shafts supporting the grinding wheels, which are devoid of vibrations, since they are supported at two supporting regions, arranged near the end portions thereof.

From the above disclosure it should be apparent that the invention fully achieves the intended aim and objects.

In particular, it is to be pointed out that there has been provided a machine which is very reliable in operation and which, accordingly, can be used by users which must very frequently grind and sharpen their working cutting tools.

The invention as disclosed is susceptible to several variations and modifications, all of which will come within the scope of the inventive idea.

Moreover, all of the details can be replaced by

other technically equivalent elements.

In practicing the invention, the used materials, provided that they are compatible to the intended use, as well as the contingent size and shapes can be any according to requirements.

Claims

1. An improved machine for grinding and sharpening blades in general, characterized in that said machine comprises a bearing framework, which is provided with a front plate and a rear plate, supporting the rotary shaft of a pair of grinding wheels, arranged adjoining one another and between said plates, toothed belt driving means being moreover provided for causing said grinding wheels to turn in opposite turning directions.
2. An improved machine, according to Claim 1, characterized in that said machine comprises a first toothed pulley and a second toothed pulley which are respectively keyed on the grinding wheel supporting shafts, through said toothed pulleys there being entrained a toothed belt which is further entrained through a third toothed pulley in turn supported by a third supporting shaft to which there is connected an auxiliary grinding wheel, said toothed belt being driven by a driving toothed pulley connected to a driving assembly.
3. An improved machine, according to the preceding claims, characterized in that said driving assembly is supported by a slide plate, connected to said bearing framework and provided with elongated slots for allowing said plate to be displaced for tensioning said belt.
4. An improved machine, according to one or more of the preceding claims, characterized in that said grinding wheels have a flat surface contour.
5. An improved machine, according to one or more of the preceding claims, characterized in that said grinding wheels have a helical contour.
6. An improved machine, according to one or more of the preceding claims, characterized in that said grinding wheel helical contour is rounded at axial end portions thereof.
7. An improved machine, according to one or more of the preceding claims, characterized in that said machine further comprises a guiding plate having a notch, arranged between said grinding wheels, and adapted to define the location point of the blade to be ground and sharpened.

8. An improved machine, according to one or more of the preceding claims, characterized in that said guiding plate is provided with a recess at said auxiliary grinding wheel for engaging therein scissors and the like.

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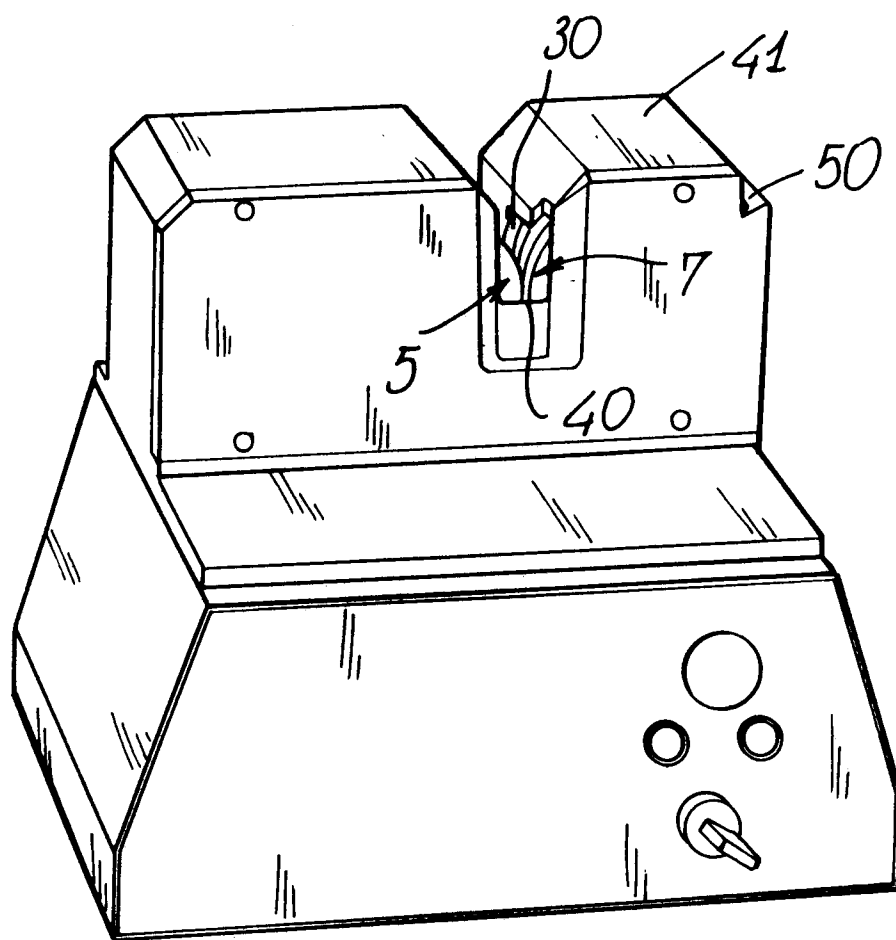
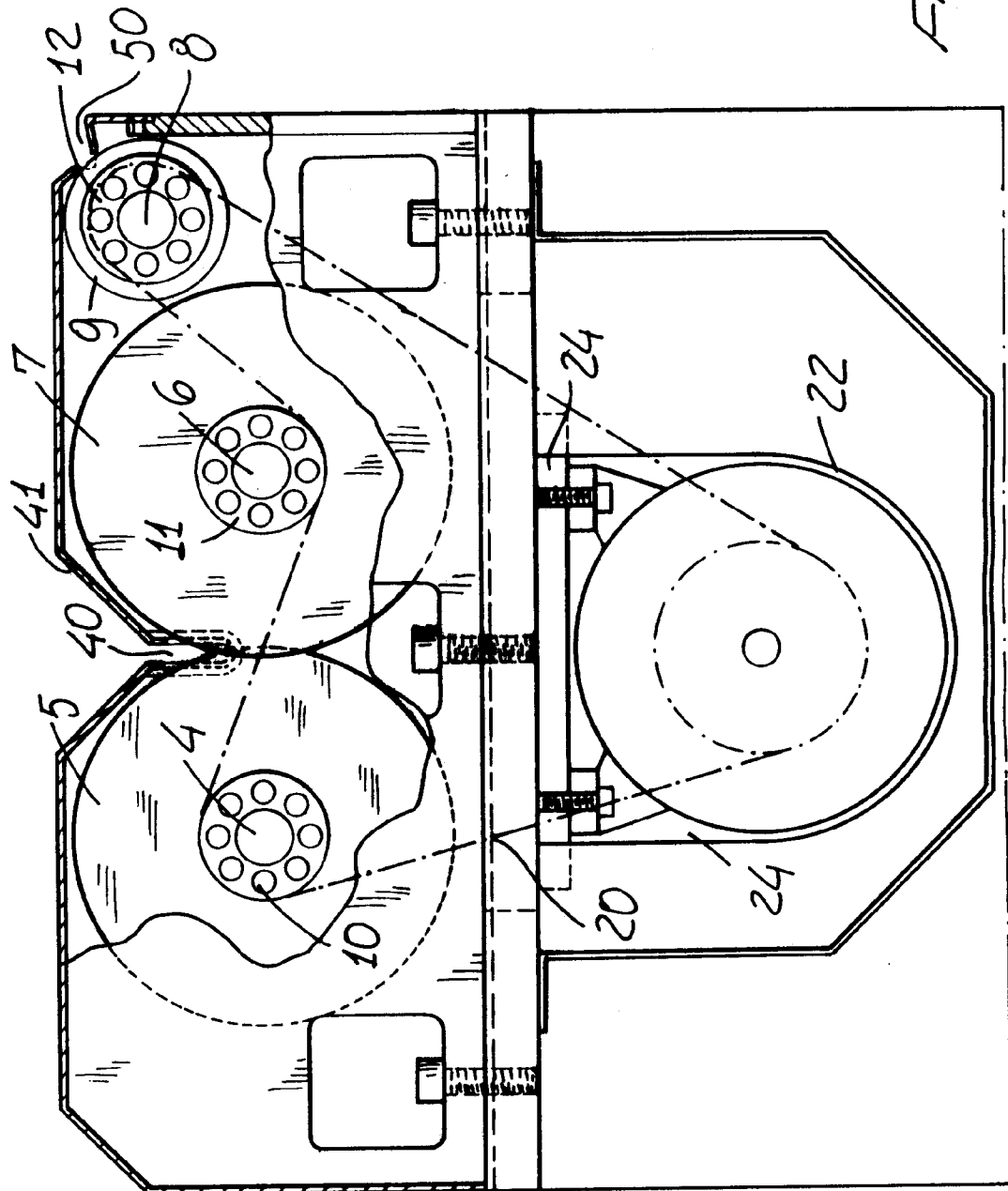
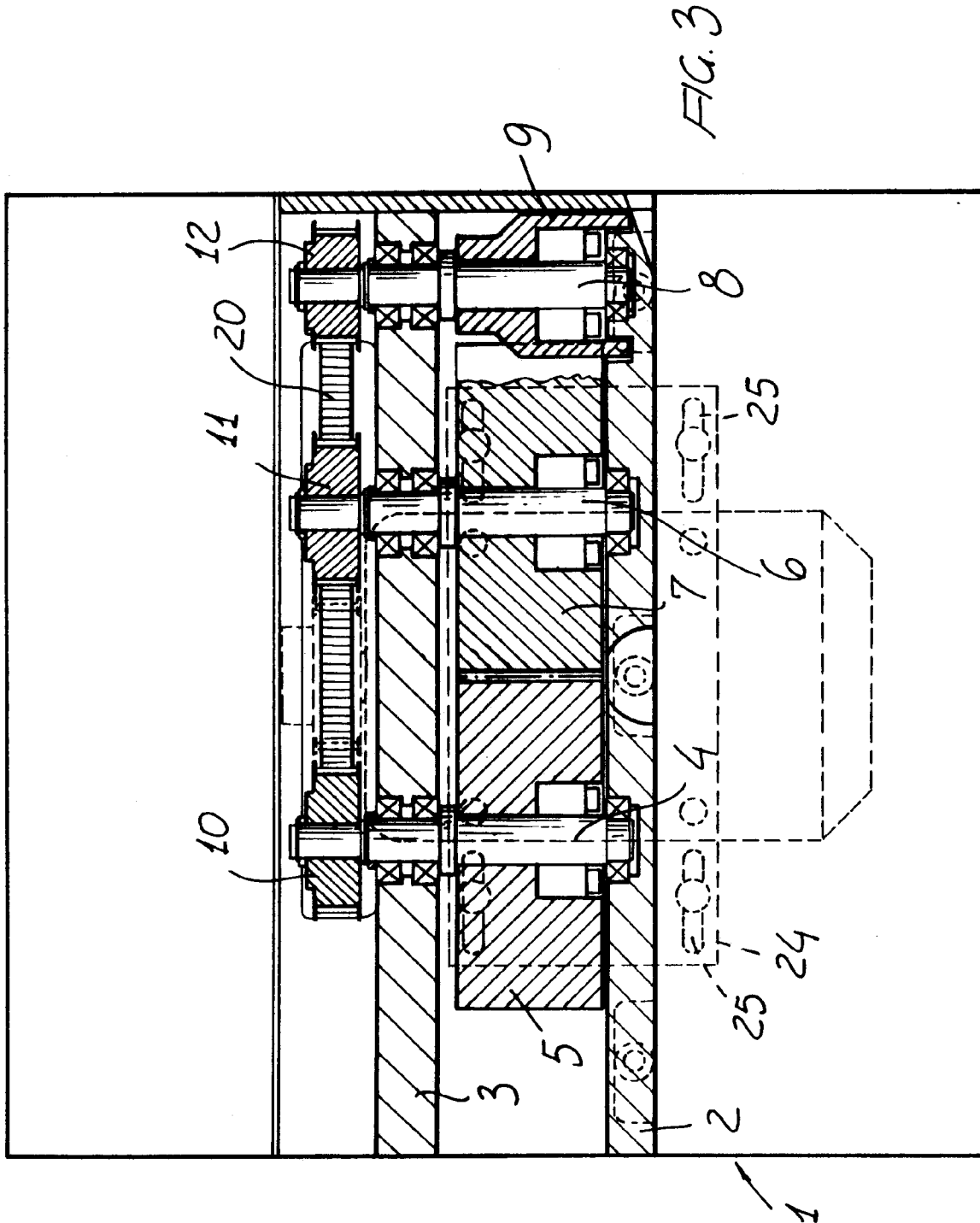


FIG. 1





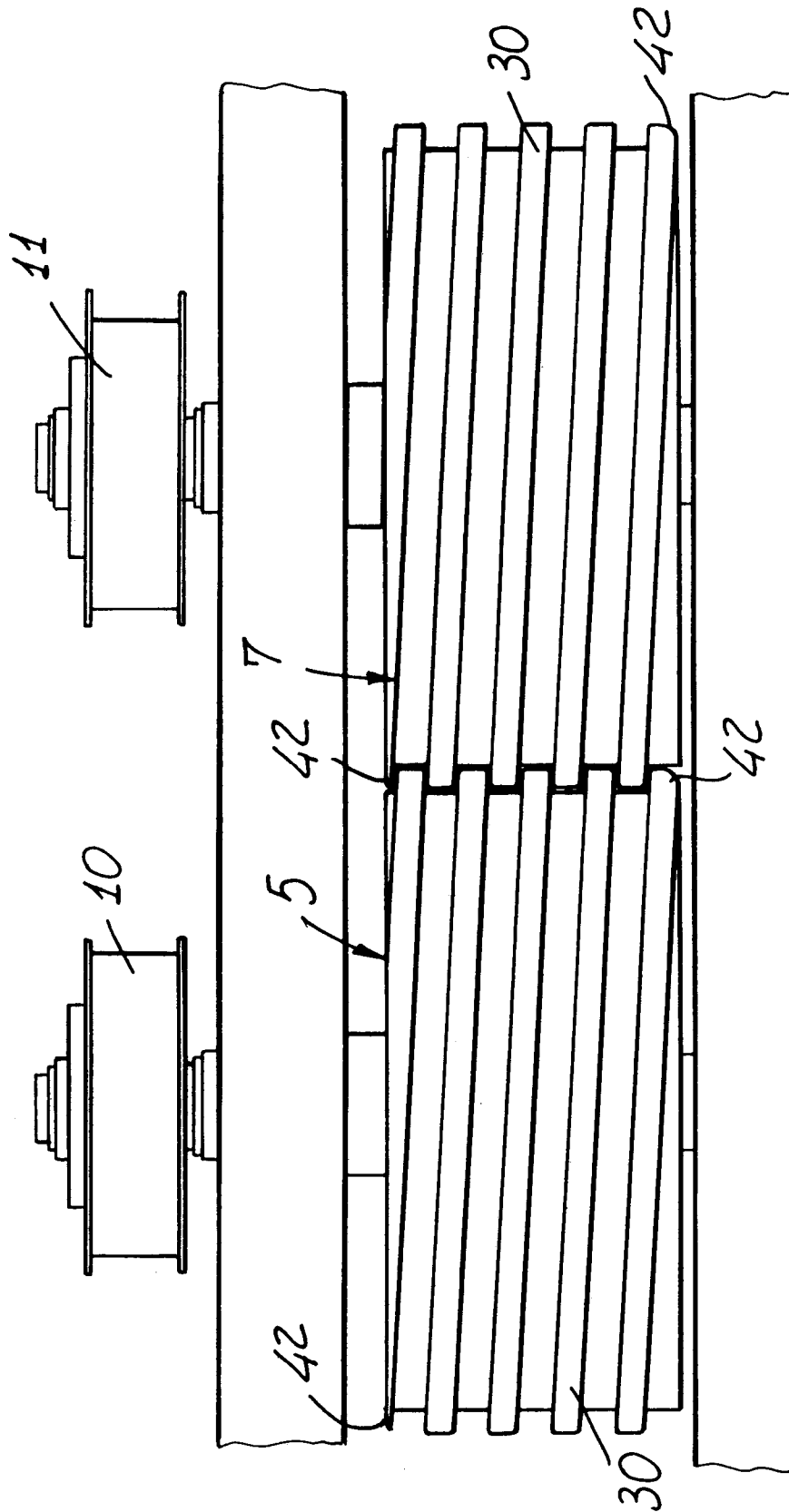


FIG. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 93 83 0306

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	DE-U-7 727 096 (FRIEDR. DICK GMBH) * page 9, line 12 - page 11, line 25; claims 1-12; figures 1,2 * ---	1-7	B24B3/52 B24B3/54
A	EP-A-0 349 017 (FRIEL, DANIEL D.) * abstract; figures 1,2 * ---	1,8	
A	US-A-3 332 173 (A. J. MCMASTER ET AL.) * column 5, line 4 - column 6, line 43; figures 1-9 * -----	1,8	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B24B
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 22 NOVEMBER 1993	Examiner CUNY J.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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