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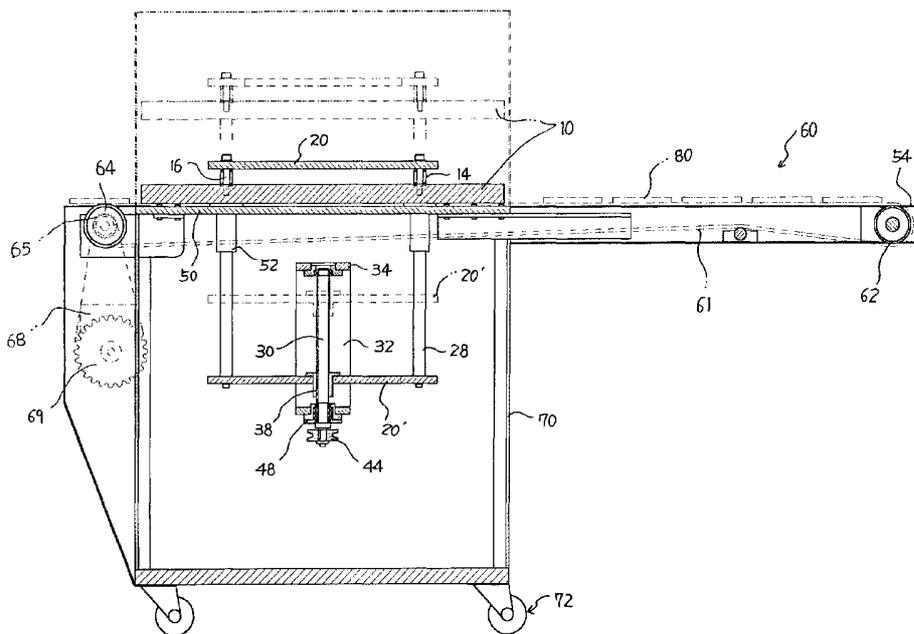
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: TOWEL PRINTING APPARATUS



(57) Abstract: Disclosed is a towel printing apparatus capable of printing a lot of towels in a short period of time through a continuous printing operation and being solving a problem in that a worker is injured his hand by a heating plate. The apparatus comprises a housing (70), a table (50) provided on an upper surface of the housing (70), a guide frame (54) mounted onto a front of the table (50), a conveyor (60) extended from a rear of the housing to a front thereof along the guide frame (54), and a heating plate (10) positioned on the table (50) and being movable up and down by a vertical moving member.



WO 03/064158 A1

TOWEL PRINTING APPARATUS

Technical Field

5 The present invention relates to a towel printing apparatus, and more particularly, to a towel printing apparatus capable of printing a lot of towels in a short period of time through a continuous printing operation.

Background Art

10 Generally, according to a typical method for printing characters or a design on one or both sides of a towel, a transfer paper with the corresponding characters or design applied thereon by chemicals is attached to a printed surface of the towel, and the characters or design is transferred to the printed surface of the towel by applying a heat to the transfer paper.

15 Considering the operation of an apparatus for implementing the typical method, after a pair of towel and transfer paper are laid on a table, a heating plate hingedly engaged to the table presses the transfer paper against the towel by pulling down a lever of the heating plate, thereby carrying out the printing operation. Alternatively, like the press operation, the heating plate may be coupled to a
20 vertically moving ram, and the towel and transfer paper are positioned on a moving path of the heating plate to print the towel.

According to the typical towel printing apparatus, the printing operation is completely implemented by a skilled person. In addition, in case that after a worker lays the towel on the table the worker does not remove quickly his hand
25 from the table, it is possible to injure his hand by the lowering ram.

Disclosure of the Invention

Therefore, an object of the present invention is to solve the problems involved in the prior art and to provide a towel printing apparatus capable of printing a lot of towels in a short period of time through a continuous printing operation.

5 Another object of the present invention is to a towel printing apparatus capable of being solving a problem in that a worker is injured his hand by a heating plate.

In order to accomplished the above mentioned objects, the present invention provides towel printing apparatus comprising a housing, a table provided on an upper surface of the housing, a guide frame mounted onto a front of the table, a
10 conveyer extended from a rear of the housing to a front thereof along the guide frame, and a heating plate positioned on the table and being movable up and down by vertical moving means.

15 **Brief Description of the Drawings**

The above objects, other features and advantages of the present invention will become more apparent by describing the preferred embodiment thereof with reference to the accompanying drawings, in which:

Fig. 1 is a cross sectional view illustrating the construction of a towel printing
20 apparatus according to a preferred embodiment of the present invention.

Fig. 2 is a top plan view of a towel printing apparatus according to a preferred embodiment of the present invention.

Fig. 3 is a side view of a towel printing apparatus according to a preferred embodiment of the present invention.

25 Fig. 4 is an exploded perspective view of a towel printing apparatus according to a preferred embodiment of the present invention.

Best Mode for Carrying Out the Invention

Reference will now be made in detail to the preferred embodiment of the present invention, an example of which is illustrated in the accompanying drawings. The detailed description on the function or construction of the known parts will be omitted for clarity.

Figs. 1 to 4 show the construction of the towel printing apparatus according to one preferred embodiment of the present invention.

As will be seen from figures, the towel printing apparatus comprises a housing 70, a table 50 provided on an upper surface of the housing 70, a guide frame 54 mounted onto a front of the table 50, a conveyor 60 extended from a rear of the housing to a front thereof along the guide frame 54, and a heating plate 10 positioned on the table 50 and being movable up and down by vertical moving means. The heating plate 10 thermally presses a transfer paper against a towel.

The construction and operation of the towel printing apparatus according to the present invention will now be explained in detail.

The housing 70 includes a plurality of casters 72 attached to a bottom thereof to facilitate the movement of the apparatus, and the table 50 is provided on the upper surface of the housing 70. The guide frame 54 is horizontally mounted onto the front of the table 50. The conveyor 60 is installed in the guide frame 54 in such a manner that it is extended from the rear of the housing to the front thereof. Specifically, rollers 62 and 64 are installed on a front of the guide frame 54 and a rear of the table 50, respectively, and a belt 61 is disposed between the front and rear rollers. One portion of the rear roller 64 is engaged with a chain gear 65, and an electric motor 68 is mounted onto the rear of the housing 70. A driving shaft of the electric motor is engaged with a chain gear 69. The chain gear 69 is coupled to the chain gear 65 via a chain. Wherein, an upper portion of the belt 61 is transferred to an upper surface of the table 50.

The heating plate 10 is positioned on an upper portion of the table 50 and is movable up and down by the vertical moving means. The vertical moving means includes a threaded rod 30 assembled to a stationary member 32 extended downwardly from the table 50, a lower movable plate 20' moved vertically by the rotation of the threaded rod, and an upper movable plate 20 coupled to an engaging rod fixed to an upper surface of the heating plate 10. The heating plate 10 is mounted under the upper movable plate 20. In particular, the stationary member 32 includes an upper plate 34 on its upper portion, a lower plate on its lower portion, and a bearing casing 48 disposed between the upper and lower plates. The treaded rod 30 is vertically installed in the bearing casing 48. A nut 38 is threadly engaged to the threaded rod 30, and the lower movable plate 20' with a pair of arms 22 extended from both front and rear sides is attached to the nut 38. An engaging rod 28 is installed on an end of each arm, and the upper movable plate 20 having the same shape as that of the lower movable plate 20' is mounted onto the engaging rod 28 and is fixed by a bolt 24. Specifically, the lower movable plate 20' is vertically moved in the stationary member 32, and the upper movable plate 20 is moved along the lower movable plate on the table 50. Meanwhile, a lower end of the threaded rod 30 is protruded downward from a lower plate 36 of the stationary member, so that the lower end is coupled to a pulley 44. The pulley 44 is connected to a driving pulley of the electric motor, which is provided in the housing, via a belt.

The heating plate 10 is fixed under the upper movable plate 20, and has heating means therein. Desired resilience means is disposed between the heating plate 10 and the upper movable plate 20. The resilience means is a spring 14 located between the upper movable plate 20 and the heating plate 10, thereby resiliently pressing the towel 80 against the table. Specifically, a bolt 16 is extended from the upper movable plate 20 to the upper surface of the heating plate 10, and accommodates the coil spring 14.

The operation of the towel printing apparatus of the present invention will now be explained in detail.

After the heating plate is sufficiently heated by the heating means, towels 80 are consequently laid on the front of the conveyor 60. At that time, it is preferable to place a print paper 82 on the upper surface, i.e., a printed surface, of the towel. And then, the towels are transferred into the housing 70 along the belt by the operation of the conveyor. At the same time, if the electric motor 40 located under the table 50 operates, the threaded rod 30 is rotated, and the lower and upper movable plates 20' and 20, which are engaged to the threaded rod are lowered. Accordingly, the heating plate 10 is also lowered to press the upper surface of the towel 80. At that time, the heating plate 10 is resiliently operated by means of the spring disposed between it and the upper movable plate 20. With the process, the high temperature of the heating plate causes the transfer chemicals to be transferred to the transfer paper, thereby printing the upper surface of the towel. After that, the reverse rotation of the electric motor 40 causes the threaded rod to be reversely rotated, so that the upper and lower movable plates 20 and 20' and the heating plate 10 are lifted along the threaded rod. The towel of which the printing operation is completed is moved backward according to the operation of the conveyor, and is fallen from the rear of the conveyor to be gathered in a container. The printing operation of the towel positioned on the front of the conveyor is continuously implemented through the above process.

Industrial Applicability

As apparent from the above description, according to the towel printing apparatus of the present invention, if the towel is placed in properly on the front of the conveyor, the towel is moved into the heating plate by the conveyor, the heating plate being movable up and down. Therefore, it may prevent that the worker is

injured his hand by the heating plate, and a lot of towels can be printed in a short period of time through a continuous printing operation .

Claims

1. A towel printing apparatus comprising:
 - a housing 70;
 - 5 a table 50 provided on an upper surface of the housing 70;
 - a guide frame 54 mounted onto a front of the table 50;
 - a conveyor 60 extended from a rear of the housing to a front thereof along the guide frame 54; and
 - 10 a heating plate 10 positioned on the table 50 and being movable up and down by vertical moving means.

2. The towel printing apparatus as claimed in claim 1, wherein the vertical moving means includes a threaded rod 30 inserted into a stationary member 32 extended downwardly from the table 50, a nut engaged to the threaded rod, a lower
15 movable plate 20' attached to the nut, an engaging rod 28 fixed to an upper surface of the lower movable plate, and an upper movable plate 20 coupled to the engaging rod, and wherein the heating plate 10 is mounted under the upper movable plate 20.

3. The towel printing apparatus as claimed in claim 2, wherein resilience means
20 is disposed between the upper movable plate 20 and the heating plate 10.

4. The towel printing apparatus as claimed in claim 3, wherein the resilience means is a spring 14.

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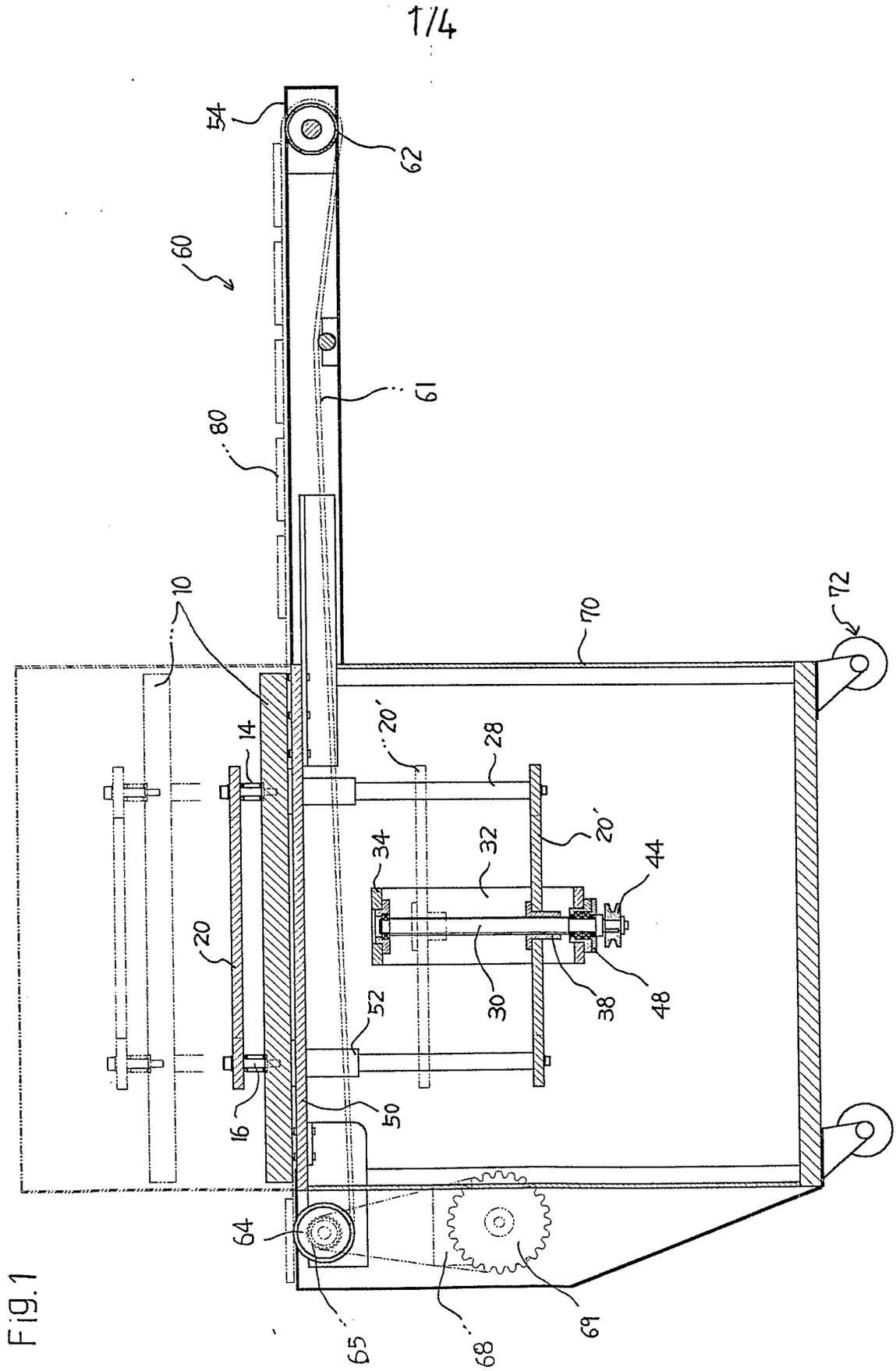
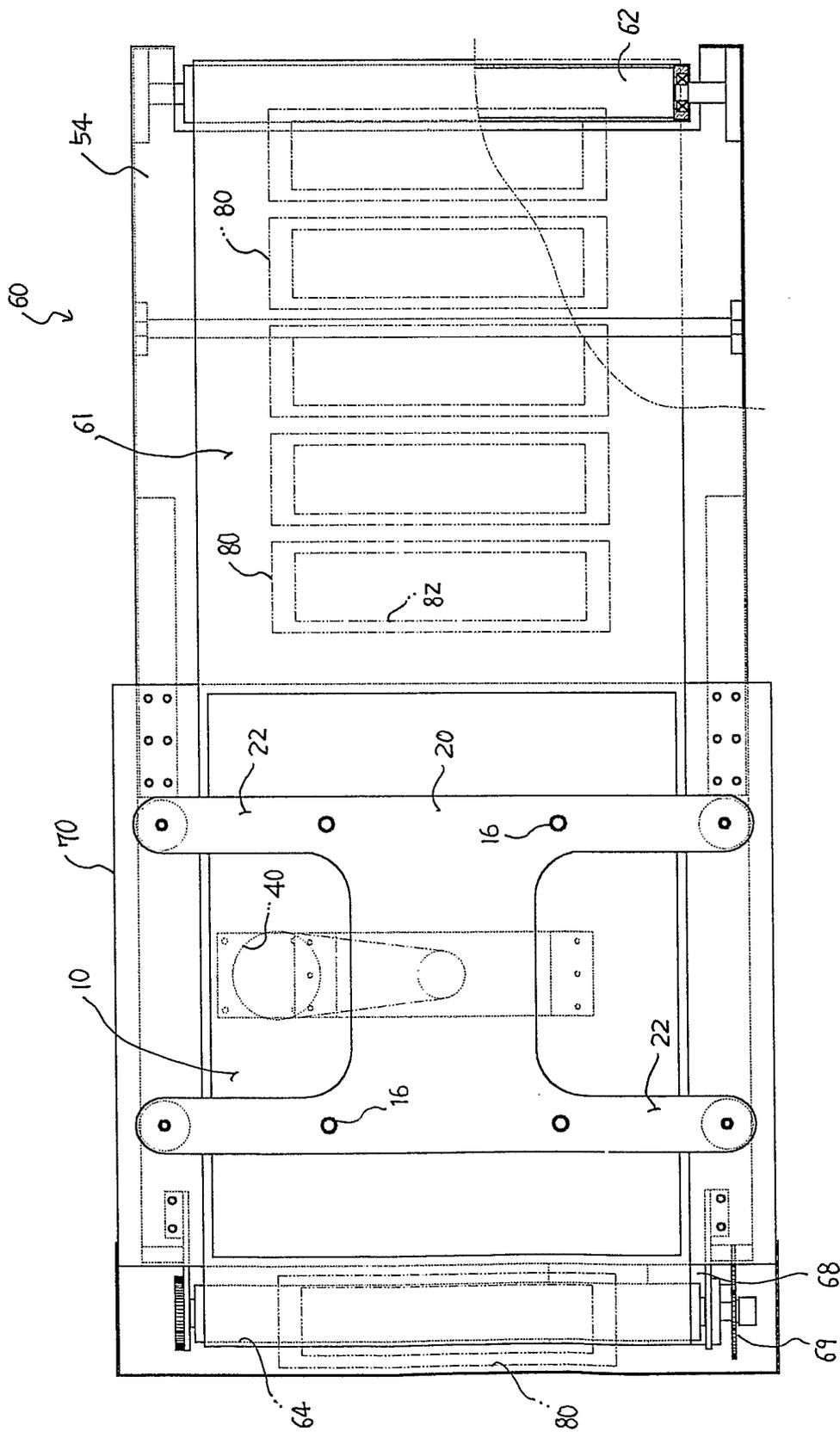
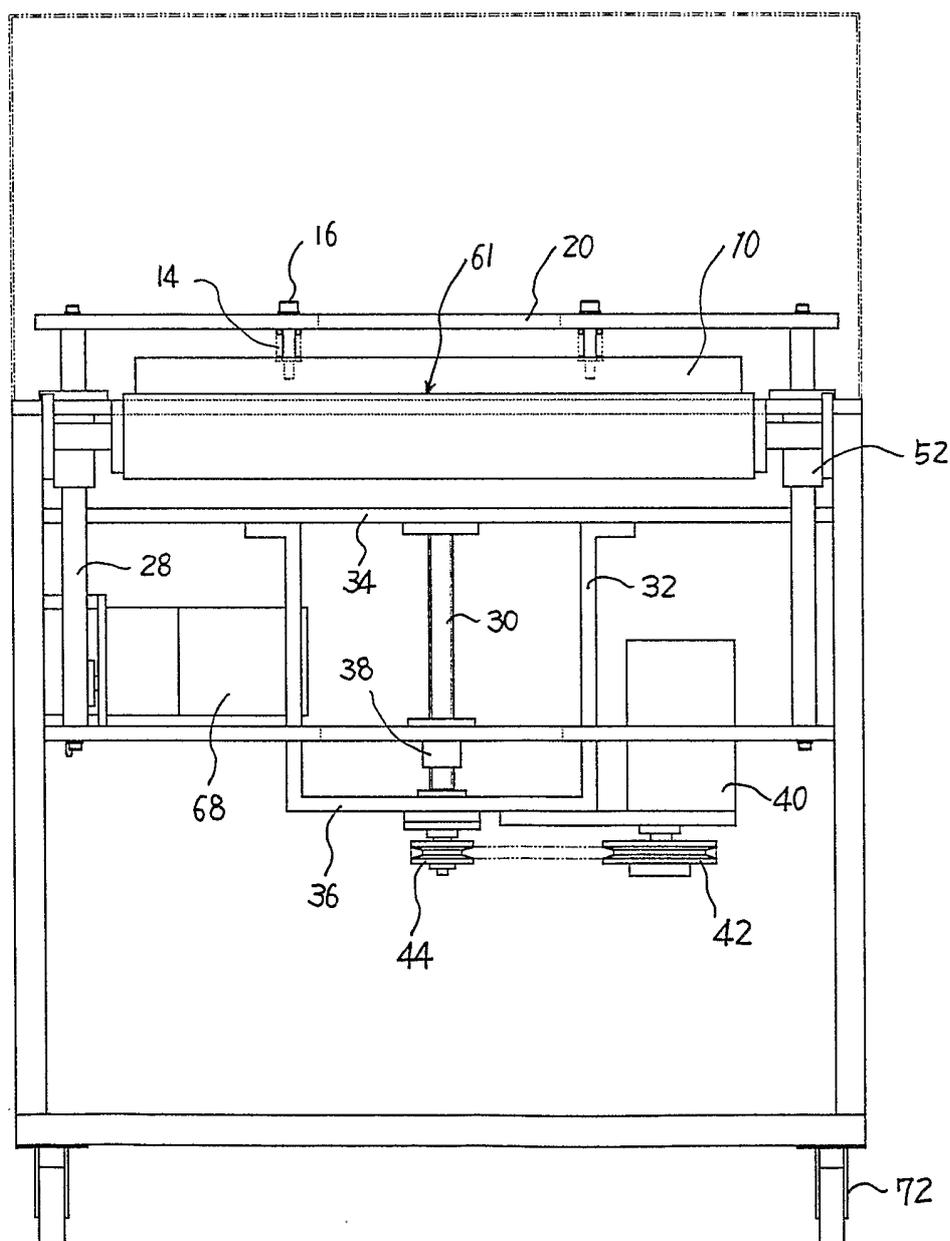


FIG. 2



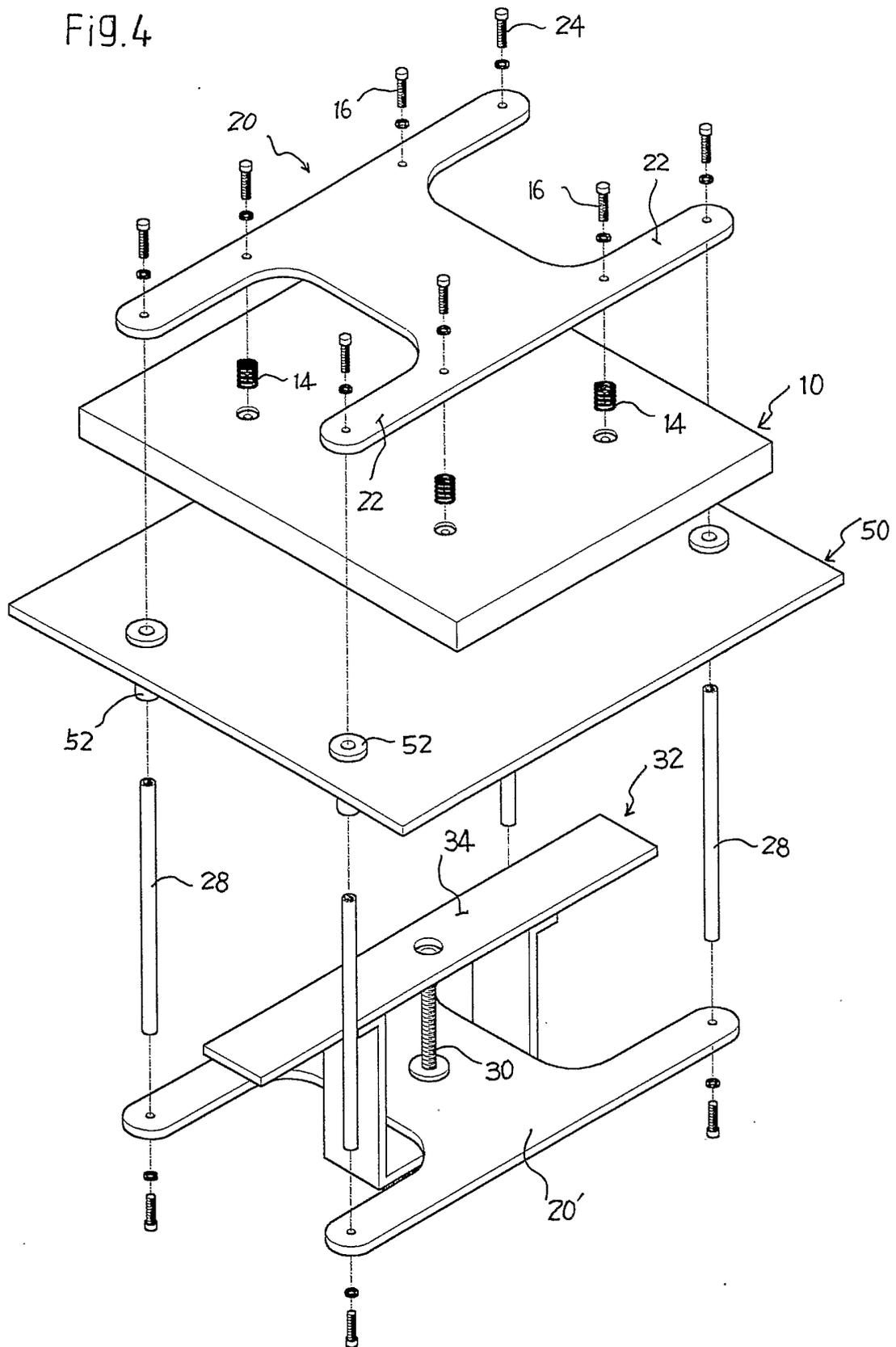
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Fig. 3



4/4

Fig.4



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR02/00120**A. CLASSIFICATION OF SUBJECT MATTER**

IPC7 B41F 17/00, B41F 15/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B41F 17/10, B41F17/00, B41F13/26, B41F 15/14

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

KOREAN PATENT AND APPLICATIONS FOR INVENTIONS SINCE 1975

KOREAN UTILITY MODELS AND APPLICATIONS FOR UTILITY MODELS SINCE 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 55-84663 A(DAIWA SPINNING CO LTD , TOSHIN KOGYO KK) 26 JUNE 1980 SEE ABSTRACT AND FIGURES	1
Y	JP 4-361656 A(SIGMA KIKAKU) 15 DECEMBER 1992 SEE ABSTRACT AND FIGURES	1
A	US 5,802,974 A(THE PROCTER&GAMBLE CO. LTD) 8 SEPTEMBER 1998 SEE ENTIRE DOCUMENTS	1
A	JP 61-35249 A(TSUTAYA SHOKAI) 19 FEBRUARY 1986 SEE ABSTRACT AND FIGURES	1
A	JP 63-74643 A(JINNO AKIFUMI) 5 APRIL 1988 SEE ABSTRACT AND FIGURES	1

 Further documents are listed in the continuation of Box C. See patent family annex.

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