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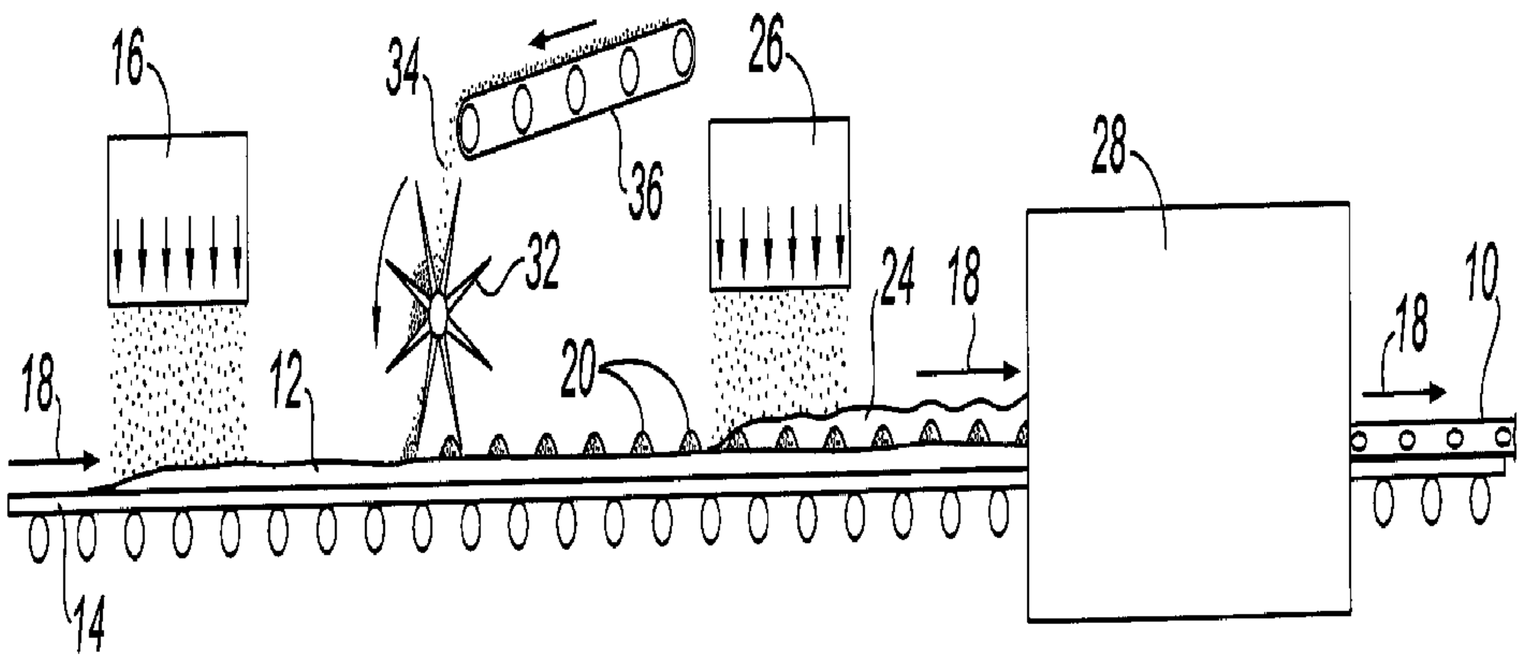
(54) **PANNEAU COMPOSITE ET SA METHODE DE FABRICATION**

(54) **COMPOSITE PANEL AND METHOD OF MAKING THE SAME**



(57) A composite panel includes fibres adhered together by means of an adhesive binder to form a sheet having opposed planar faces. Fibre reinforcement ribs are imbedded in the sheet.

UNITED STATES/CANADA

ABSTRACT OF THE DISCLOSURE

A composite panel includes fibres adhered together by means of an adhesive binder to form a sheet having opposed planar faces. Fibre reinforcement ribs are imbedded in the sheet.

TITLE OF THE INVENTION:

composite panel and method of making the same

NAME(S) OF INVENTOR(S):

Michael Helmut Wolff

FIELD OF THE INVENTION

The present invention relates to a composite panel and a method of making the same.

BACKGROUND OF THE INVENTION

While composite panels are typically made out of wood fibre, they can be made out of other materials such as straw. Composite panels made out of wood fibre are known by a variety of names, including: oriented strandboard, wafer board, and chip board. In the past, structural reinforcement of these composite panels has been achieved by selection of the shape of the panel. For example, some success has been obtained through the use of a sinusoidal form, commonly known as "wave board". United States Patent 3,083,128 and United States Patent 4,904,517 disclose structural reinforcement through a plurality of external reinforcing ribs.

Unfortunately, the same features of shape or configuration that provide composite panels with their structural reinforcement, have inherent disadvantages that have retarded their commercial acceptance. The panels are difficult to manufacture, as special press platens are required to create the special shapes. The special press platens are difficult to adapt to high speed, high volume production runs. Consequently, the composite panels have tended to be expensive. In use, the special shapes make the composite panels difficult to consistently cut to a desired size and, generally, make them more difficult to work with.

SUMMARY OF THE INVENTION

What is required is a structurally reinforced composite panel that derives its structural reinforcement from other than its shape.

According to one aspect of the present invention there is provided a composite panel which includes fibres adhered together by means of an adhesive binder to form a sheet having opposed planar faces. Fibre reinforcement ribs are imbedded in the sheet.

The composite panel constructed in accordance with the teachings of the present invention has planar faces. This enables it to be manufactured with only minor changes to the forming lines of existing plants. The resulting composite panels can be used for virtually any application. The structural reinforcement is embedded in the wood panel in the form of reinforcement ribs. The reinforcement ribs can take a number of forms. For example, the reinforcement ribs can be parallel and spaced at intervals along the sheet or can be serpentine.

According to another aspect of the present invention there is provided a method of making a composite panel. A first step involves laying a continuous first layer of fibres mixed with an adhesive binder. A second step involves laying onto the first layer, reinforcement ribs of fibres mixed with an adhesive binder. A third step involves laying onto the first layer a continuous second layer of fibres mixed with an adhesive binder. A fourth step involves pressing the first layer and the second layer together to form a panel with planar opposed faces. The reinforcement ribs are imbedded in the panel.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become more apparent from the following description in which reference is

made to the appended drawings, wherein:

FIGURE 1 is side elevation view of a conveyor along which the steps in the preferred method of making a composite panel occur.

FIGURE 2 is a top plan view of the conveyor illustrated in **FIGURE 1**, with parallel spaced reinforcement ribs being formed.

FIGURE 3 is a side elevation view of a mechanism for forming the parallel spaced reinforcement ribs illustrated in **FIGURE 2**.

FIGURE 4 is a side elevation view, in section, of a composite panel fabricated in accordance with the preferred method.

FIGURE 5 is a top plan view of a mechanism for forming serpentine reinforcement ribs illustrated in **FIGURE 2**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment, a composite panel generally identified by reference numeral 10, and the method of making the same will now be described with reference to **FIGURES 1** through **5**.

Referring to **FIGURE 1**, the preferred method of making a composite panel includes the following steps. A first step involves laying a first layer 12 of fibres, such as wood particles or straw, mixed with an adhesive binder. In the illustrated embodiment first layer 12 is placed onto a moving conveyor 14 by means of one or more formers 16. The conveyer is moving in the direction indicated by the arrow 18. A second step involves laying onto first layer 12 reinforcement ribs 20 of fibres mixed with an adhesive binder. This is accomplished by means of one or more rib formers 22. Referring to **FIGURE 2**, the reinforcement ribs 20 may be parallel and linear in shape and may be either collinear or transverse with respect to the length of the panel. The structural strength properties of the panel will be determined by the reinforcement rib placement pattern, spacing and density. Referring to **FIGURE**

5, the reinforcement ribs may alternatively be made serpentine 30. More complex patterns may be achieved by means of a microprocessor controlled forming mechanism that can traverse the production line perpendicular and parallel to the line direction. It will be obvious to one skilled in the art that the selection of the shape and spacing of the ribs will be made based on the requirements imposed by the intended use of the panel. Referring to **FIGURE 3**, parallel linear reinforcement ribs 16 can be formed using, for example, a paddle wheel 32. Fibres 34 are fed to paddle wheel 32 by, for example, a second conveyer 36. The spacing of the reinforcement ribs is determined by the speed of rotation of paddle wheel 32 relative to the speed of conveyer 14. The dimensions of the reinforcement ribs 20 are determined by the speed of second conveyer belt 36 relative to the speed of rotation of paddle wheel 32. A third step involves laying onto first layer 12, a second layer 24 of fibres mixed with an adhesive binder by means of one or more formers 26. A fourth step involves using a press 28 to press first layer 12 and second layer 24.

Referring to **FIGURE 4**, a composite panel fabricated in accordance with the teachings of the above described method, is generally identified by reference numeral 40. Panel 40 has planar opposed faces 42 and 44. Imbedded within panel 40 are reinforcement ribs 20.

It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A composite panel, comprising:

fibres adhered together by means of an adhesive binder to form a sheet having opposed planar faces, the sheet having fibre reinforcement ribs imbedded in the sheet.

2. The composite panel as defined in Claim 1, wherein the reinforcement ribs are parallel and spaced at intervals along the sheet.

3. The composite panel as defined in Claim 1, wherein the reinforcement ribs are serpentine.

4. A method of making a composite panel, comprising the steps of:

firstly, laying at least one continuous first layer of fibres mixed with an adhesive binder;

secondly, laying onto the at least one first layer reinforcement ribs of fibres mixed with an adhesive binder;

thirdly, laying onto the at least one first layer at least one continuous second layer of fibres mixed with an adhesive binder; and

fourthly, pressing the at least one first layer and at least one second layer to form a panel with planar opposed faces and the reinforcement ribs imbedded in the panel.

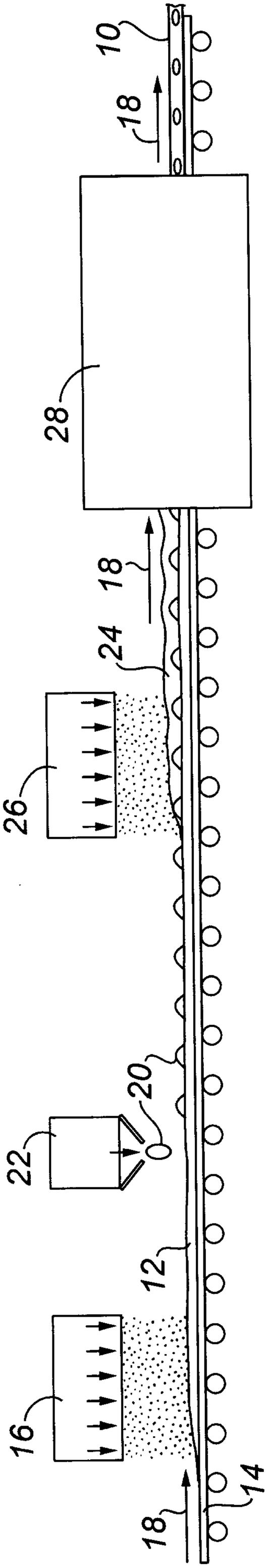


FIG. 1

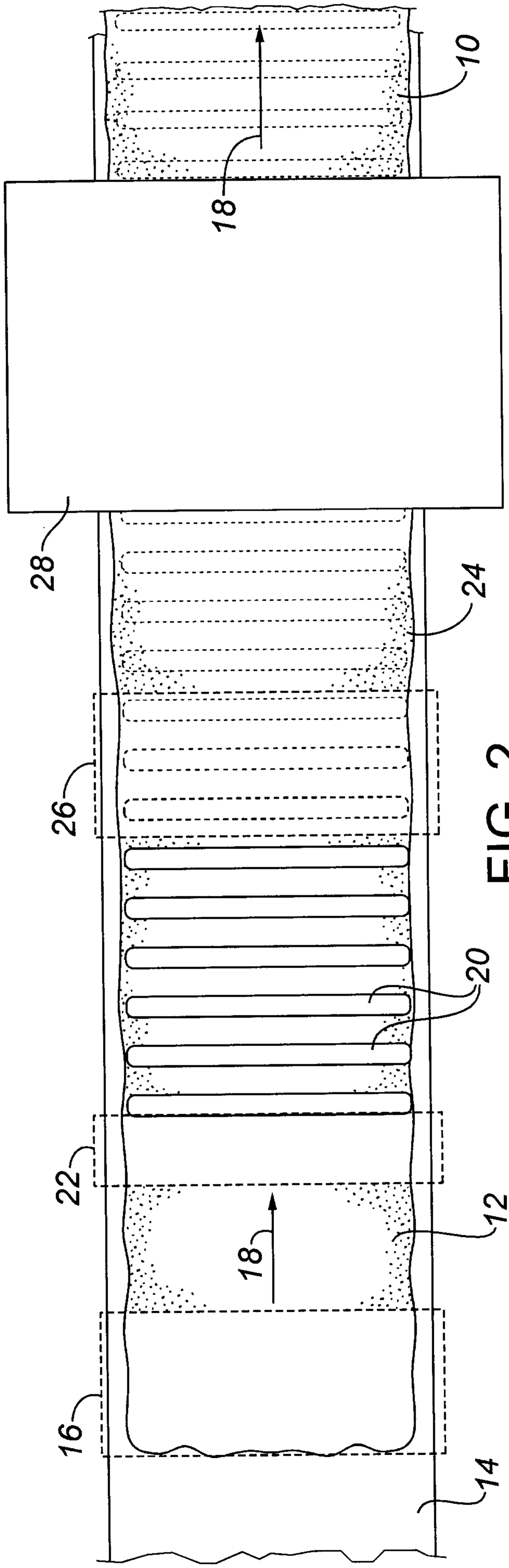


FIG. 2

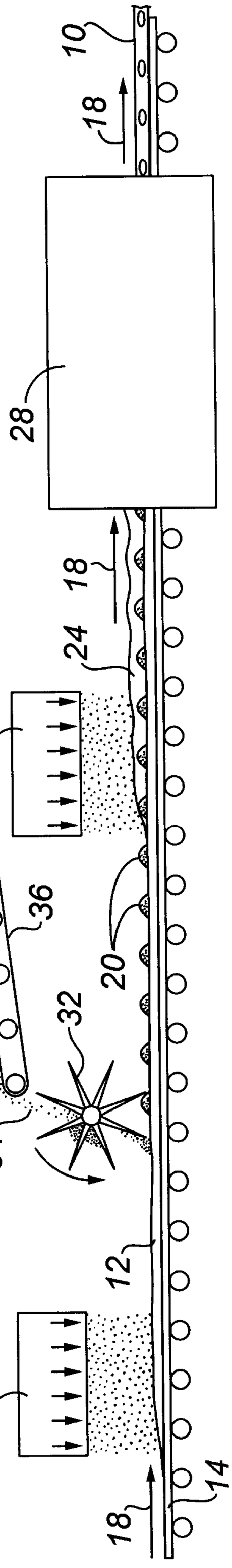


FIG. 3

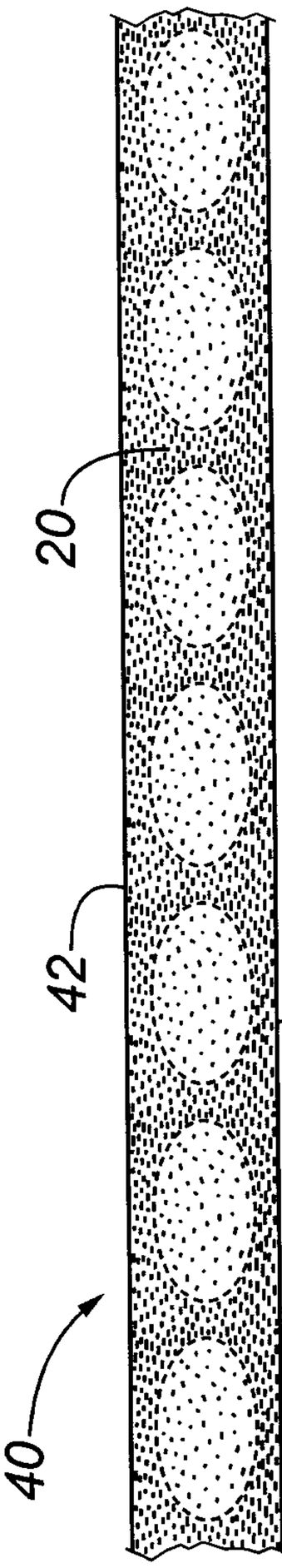


FIG. 4

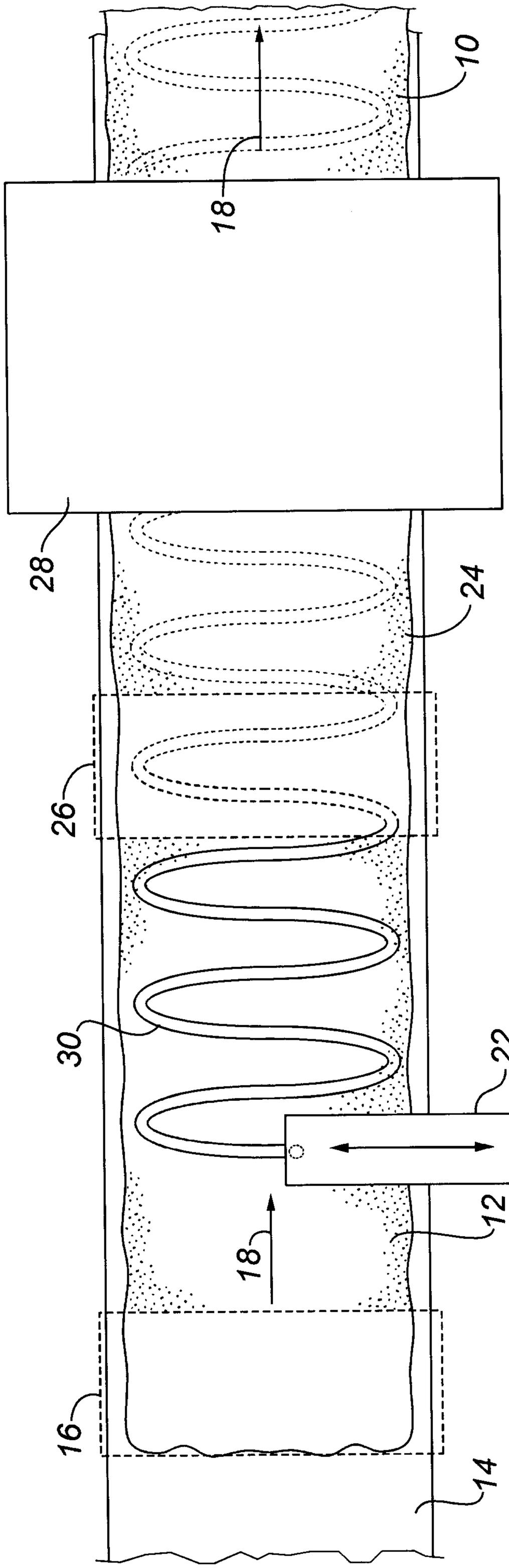


FIG. 5