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(54) **Production method for a concrete pillar or beam.**

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Description

The present invention concerns a production method for fabricating a concrete pillar or beam, according to which method the concrete mix is sprayed against the wall of a mold having a predetermined shape, after which the concrete surface is smoothed by levelling.

With reference to Finnish patent applications 872244, (published 22.11.88)(& EP-A-292452, published 23.11.88) and 872245, (published 22.11.88), similar production methods have been previously disclosed for planar wall elements and for cylindrical pillars or beams resp. The aim of the present invention is to achieve advancements in this production method. AU-A-474397 refers to an apparatus for trueing concrete-clad pipes having a rotary brush arranged with its rotational axis substantially parallel to the axis of the pipe body. This means that the apparatus according to this reference can not produce a carefully levelled surface if the outer cross-section of the pipe body is not circular, as the surface of the trueing brush facing the pipe body surface has its rounded envelope surface in contact with the pipe body surface. The method in accordance with the invention is characterized in that the concrete surface is levelled with the help of a surfacing disc, rotatable about an axis being substantially perpendicular to the longitudinal direction of the pillar or beam, whereby the pillar or beam is rotated through equal fractions of 360° or indexed so as to place on side of the pillar or beam at a time facing the surfacing disc so that the pillar or beam achieves a section of a square, rectangle, pentagon, hexagon, or a similar form. Thus, with the help of the invention, pillar constructions with an appealing look are achieved that are readily transferrable and transportable by virtue of their hollow-core construction. Although the concrete pillar has a hollow-core structure, its compressive strength will be sufficient for a majority of applications. If necessary, the hollow core can be filled with concrete mix.

An embodiment of the invention is caracterized by having the mold rotatable about its vertical axis and having a positional clamping facility for spraying and surfacing. This approach results in a quick production method for a concrete pillar, which is then transported for curing and hardening after spraying and surfacing.

Another embodiment of the invention is characterized by having the mold placed in a horizontal rotator, and the rotator is used for turning the beam during production to alternately align three of the four sides of the beam facing the concrete spray gun and the surfacing disc so as to achieve a U-shape cored beam structure. This approach results in a cored beam structure, which has a predetermined structural strength and can be, when required, further steel-reinforced and filled with concrete mix at the construction site.

A further embodiment of the invention is characterized by having the mold structure fabricated by winding plastic material, thin steel sheet or like material over elongated bars positioned so as to achieve a desired shape of the mold. The mold structure is further provided with, e.g., reinforcement fabric which offers improved adherence for the sprayed concrete mix prior to the surfacing operation.

In the following, the invention will be examined in more detail by means of exemplifying embodiments with reference to the attached drawings, in which

Figs. 1 and 2	show a cross-sectional view of a production method for a pillar with hexagonal cross-section.
Figs. 3...8	show a production method for a beam structure with U-shaped cross-section.
Fig. 9	shows the removal of a ready-cast beam structure from the rotator.
Figs. 10...12	show cross-sections of different mold structures.
Figs. 13...17	show a production method for a vertically aligned beam.

According to the production method, concrete mix is sprayed against the walls of a mold 1, 2, 3, 4, 5 having a predetermined shape, after which the concrete surface is levelled. The concrete surface is levelled with the help of a surfacing disc 6 so by way of rotating the pillar or beam so as to place one side of the pillar or beam at a time facing the surfacing disc so that the pillar or beam achieves a desired cross-section.

In accordance with the Figs. 1 and 2 as well as Figs. 13...17, the mold is rotatable about its vertical axis and has a positional clamping facility for spraying and surfacing. In accordance with Figs. 3...9, the mold 2 is placed in a horizontally aligned rotator 7, and the rotator is used for turning the beam during production to align three of the four sides of the beam facing the concrete spray gun and the surfacing disc apparatus so as to achieve a U-shaped cored beam structure. The cored beam and the mold are removed from the rotator 7 as indicated by arrow 8. Illustrated in Figs. 10 and 13 is a method for forming the mold structure using plastic sheet wound over thin bars 9. Bars 10 and wire 11 form a fabric structure, which provides adherence to the concrete mix.

In accordance with Fig. 11, the mold can be formed from metal sheets 4 shaped as angle profiles.

In accordance with Fig. 12, the mold is formed of angle steel profiles and elongated metal sheet strips 3.

Claims

1. A production method for fabricating a concrete pillar or beam, in which method concrete mix is sprayed against the wall of a mold (1, 2, 3, 4, 5) having a predetermined shape, after which the concrete surface is smoothed by levelling,
characterized in
that the concrete surface is levelled with the help of a surfacing disc (6) rotatable about an axis being substantially perpendicular to the longitudinal direction of the pillar or beam, whereby the pillar or beam is rotated through equal fractions of 360° or indexed so as to place one side of the pillar or beam at a time facing the surfacing disc so that the pillar or beam achieves a section of a square, rectangle, pentagon, hexagon or a similar form.

2. A method as claimed in claim 1,
characterized in
that the mold (1, 5) is rotatable about its vertical axis and has a positonal clamping facility for spraying and surfacing.

3. A method as claimed in claim 1,
characterized in
that the mold (2) is placed in a horizontal rotator, and the rotator is used for turning the beam during production to alternately align three of the four sides of the beam facing the concrete spray gun and the surfacing disc so as to achieve a U-shaped cored beam structure.

4. A method as claimed in anyone of claims 1 to 3,
characterized in
that the mold structure is fabricated by winding plastic material, thin steel sheet or similar material over elongated bars positioned so as to achieve a desired shape of the mold.

Patentansprüche

1. Herstellungsverfahren zum Herstellen eines Betonpfeilers oder - Balkens, wobei Betongemisch gegen die Wand einer Form (1, 2, 3, 4, 5) von vorgegebener Gestalt gespritzt wird, worauf die Betonfläche durch Nivellieren geglättet wird,
dadurch gekennzeichnet, daß die Betonfläche mit Hilfe einer Oberflächen-bearbeitenden Scheibe (6) nivelliert wird, die um eine zur Längsrichtung der Säule oder des Balkens im wesentlichen senkrechte Achse drehbar ist, wobei die Säule oder der Balken um gleiche Bruchteile von 360° verdreht oder indexiert wird, um eine Seite der Säule oder des Balkens zu einem Zeitpunkt der Oberflächen-bearbeitenden Scheibe zuzuwenden, so daß die Säule oder der Balken einen Abschnitt eines Quadrates, eines Rechteckes, eines Fünfekkes, eines Sechseckes oder eine ähnliche Form erlangt.

2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß die Form (1, 5) um ihre senkrechte Achse verdrehbar ist und eine Positionierklemmeinrichtung zum Aufsprühen und Oberflächenbearbeiten aufweist.

3. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß die Form (2) in einem horizontalen Rotor angeordnet wird, und daß der Rotor dazu verwendet wird, den Balken während der Herstellung zu verdrehen, um abwechselnd drei der vier Seiten des Balkens der Betonspritzpistole und der Oberflächen-bearbeitenden Scheibe zuzuwenden, um eine U-förmige, mit einem Kern versehene Balkenstruktur zu erhalten.

4. Verfahren nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß der Formaufbau durch Aufwickeln von Kunststoffmaterial, dünnem Metallblech oder ähnlichem Material auf lange Stäbe hergestellt wird, die derart positioniert werden, daß eine gewünschte Gestalt der Form erreicht wird.

Revendications

1. Méthode de fabrication d'une poutre ou d'une colonne en béton, selon laquelle un mélange de béton est projeté contre la paroi d'un moule (1, 2, 3, 4, 5) ayant une forme prédéterminée, à la suite de quoi la surface du béton est lissée par nivellement,
caractérisée en ce que
la surface du béton est nivelée à l'aide d'un disque de surfaçage (6) pouvant tourner en rotation autour d'un axe sensiblement perpendiculaire au sens longitudinal de la poutre ou de la colonne, grâce auquel la poutre ou la colonne est pivotée par fractions égales de 360° ou est indexée de façon à placer un côté à la fois de la poutre ou de la colonne face au disque de surfaçage pour que la poutre ou la colonne soit de section carré, rectangulaire, pentagonale, hexagonale ou de forme

similaire.

2. Méthode selon la revendication 1, caractérisée en ce que le moule (1, 5) est rotatif autour de son axe vertical et possède un dispositif de blocage de position pour la projection et le surfaçage.

3. Méthode selon la revendication 1, caractérisée en ce que le moule (2) est placé dans un système de rotation horizontal, et en ce que le système de rotation sert à pivoter la poutre pendant la fabrication pour aligner tour à tour trois ou quatre côtés de la poutre face au pistolet de projection et au disque de surfaçage de manière à obtenir une structure de poutre creusée en forme de U.

4. Méthode selon l'une quelconque des revendications 1 à 3, caractérisée en ce que la structure du moule est fabriquée en enroulant un matériel plastique, de la tôle mince ou un matériel similaire autour de barreaux allongés pour obtenir la forme requise du moule.

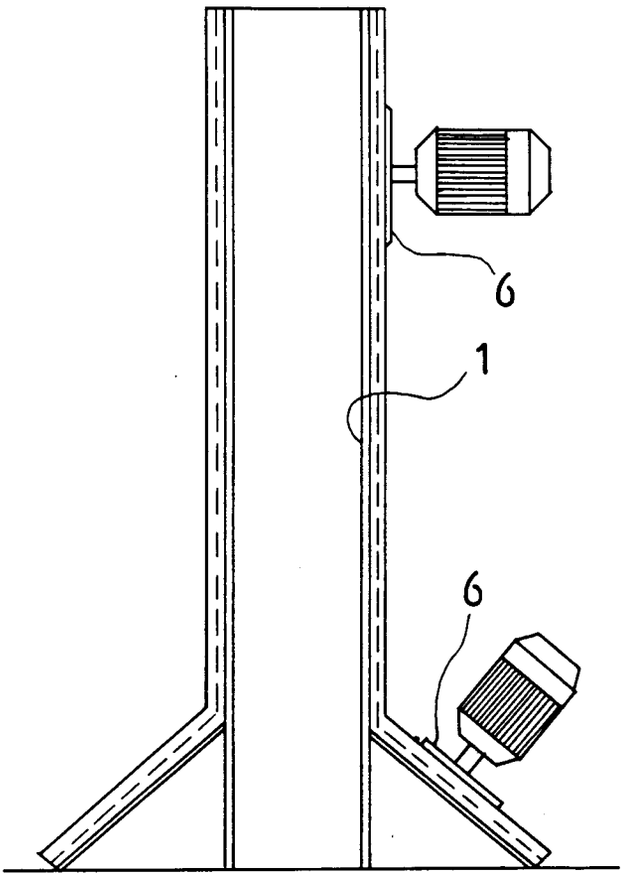

Fig.1

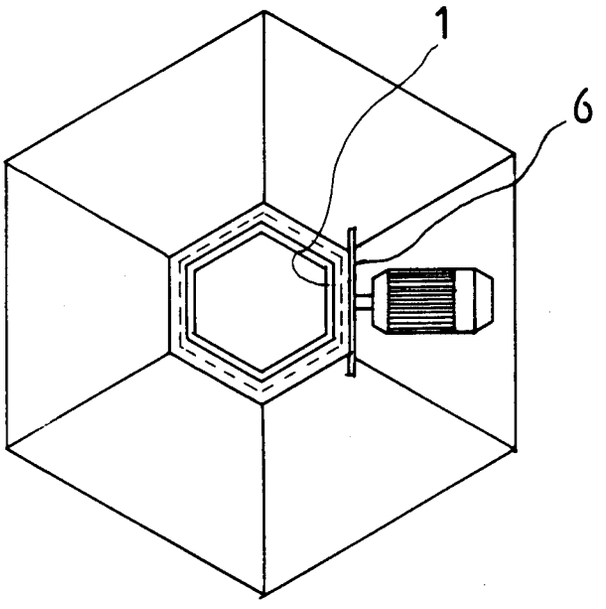

Fig.2

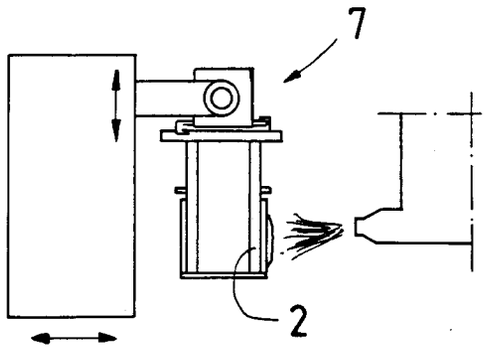

Fig.3

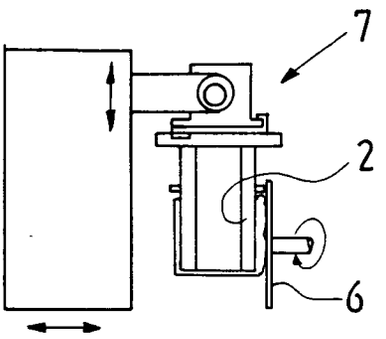

Fig.4

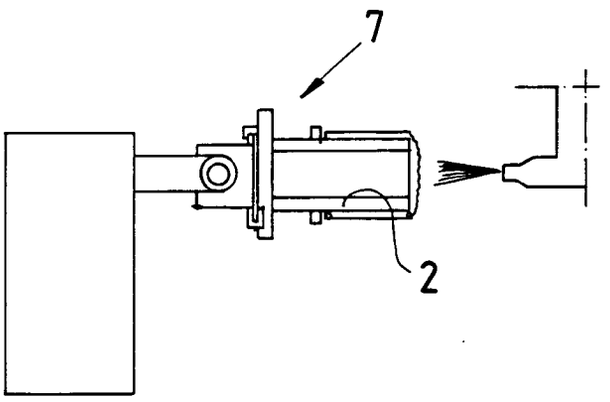

Fig.5

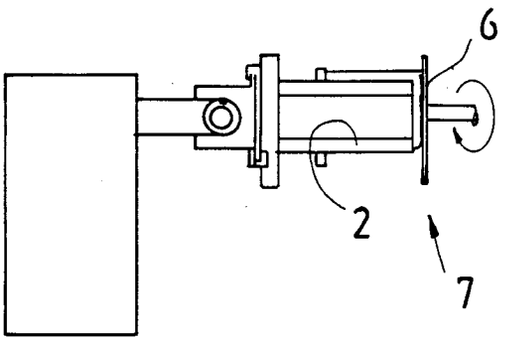

Fig.6

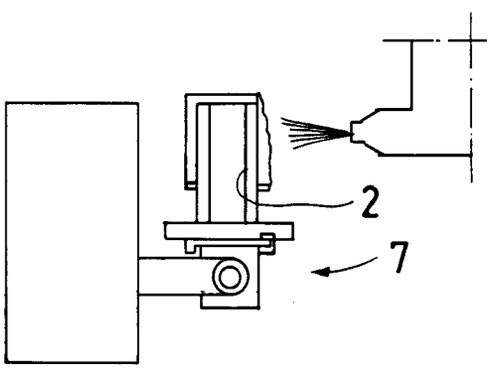

Fig.7

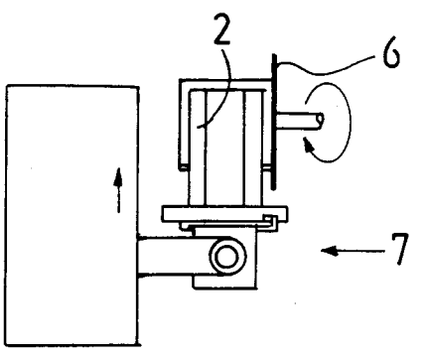

Fig.8

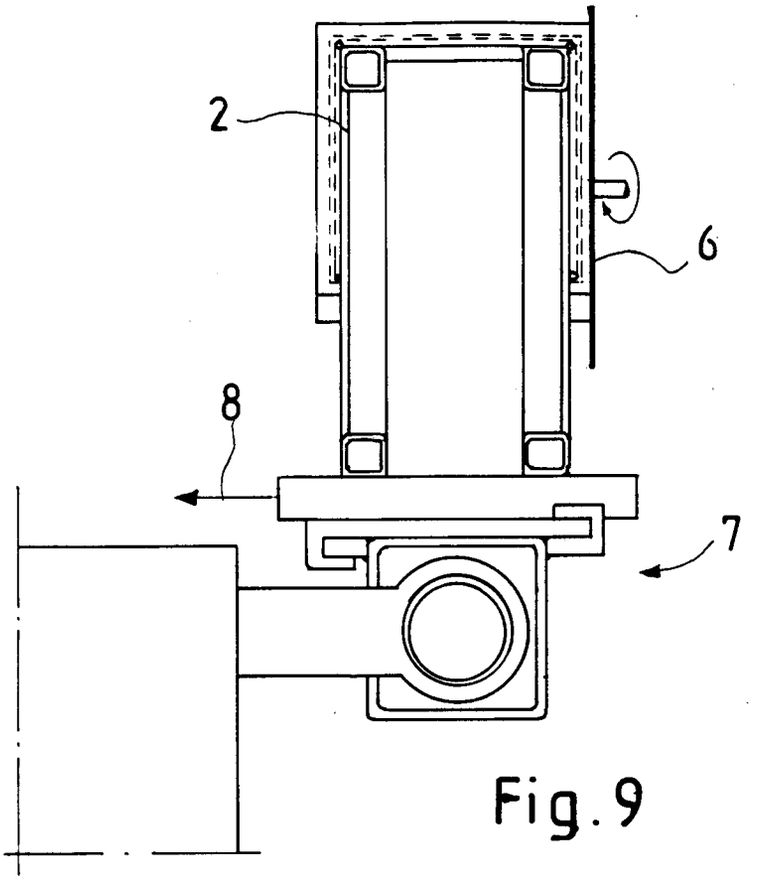

Fig.9

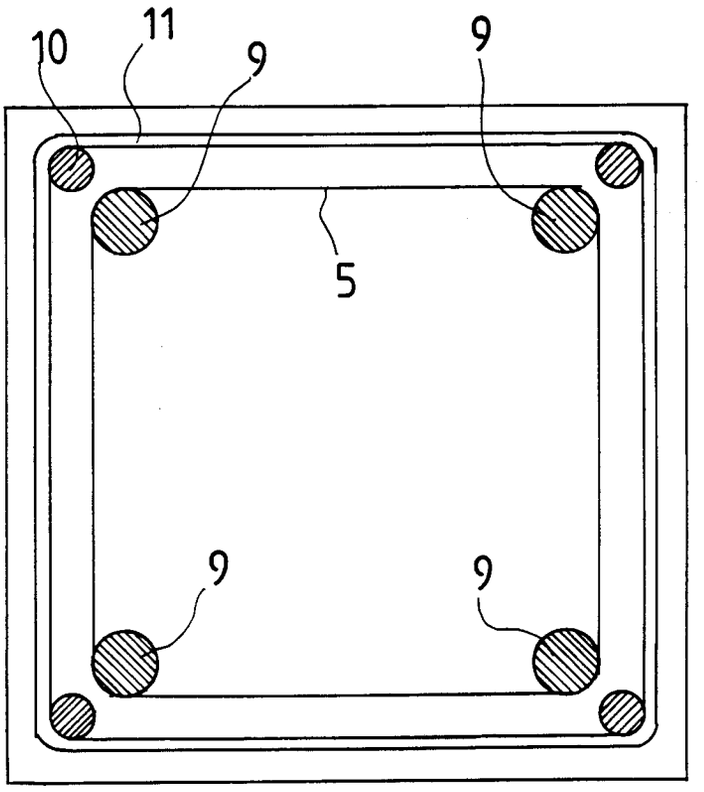

Fig.10

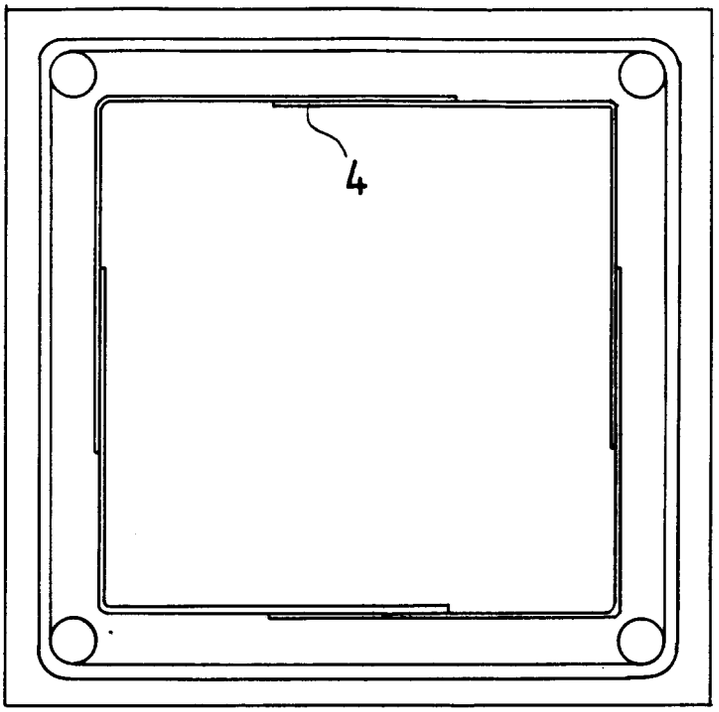

Fig.11

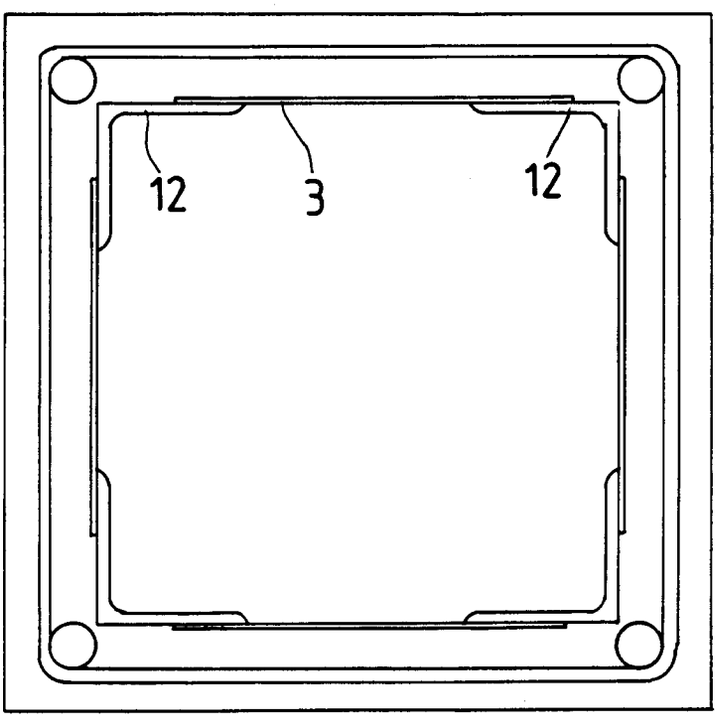

Fig.12

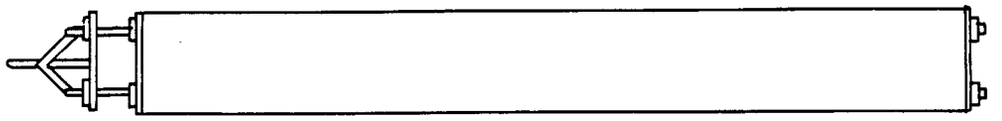

Fig.17

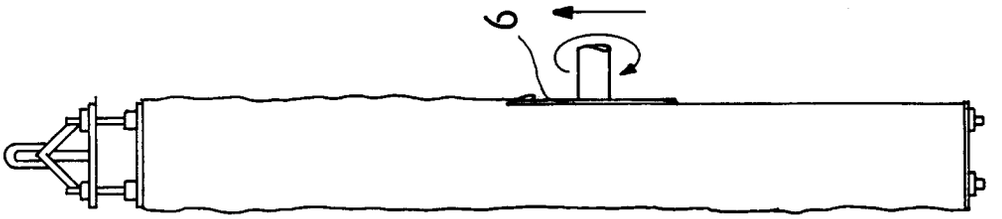

Fig.16

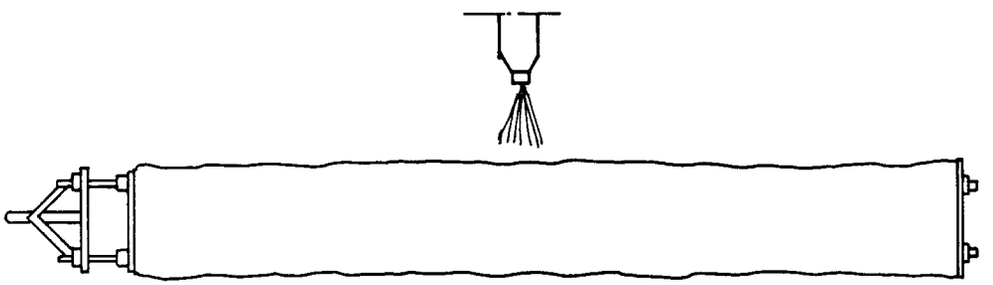

Fig.15

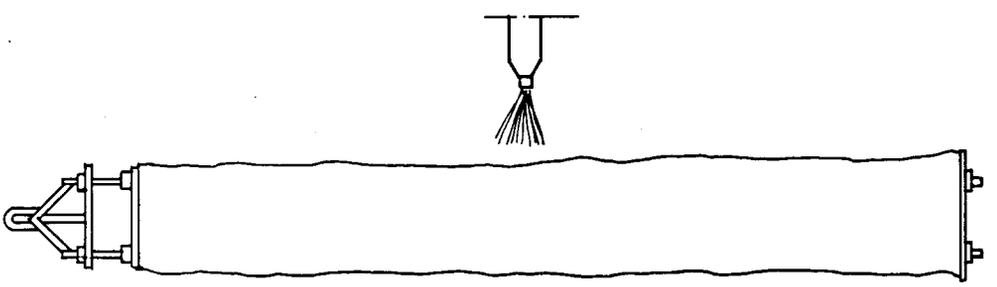

Fig.14

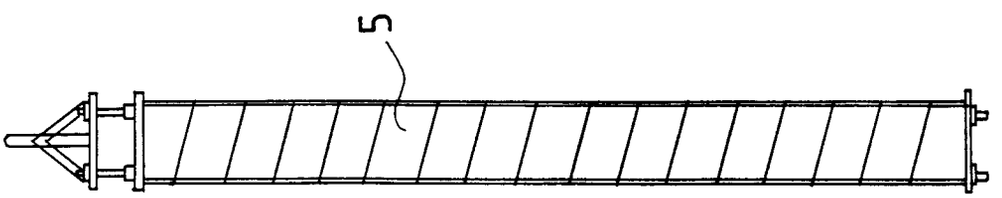

Fig.13