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## (54) Equipment for making corrugated and curved concrete surfaces with at least one impregnated network.

(57) The present invention relates to equipment made up of a number of rubber sticks (11) placed side by side, shaped in accordance with the corrugated surface required and flexible for curving in a longitudinal direction of the surface itself. The rubber sticks (11) are hallow (16), have spaced suction holes (17) and they are provided with spaced gaps (18) which are designed to create folds or beads in the surface which curves, avoiding wrinkling during the curving of the surface and forming reinforcement areas in the structure.

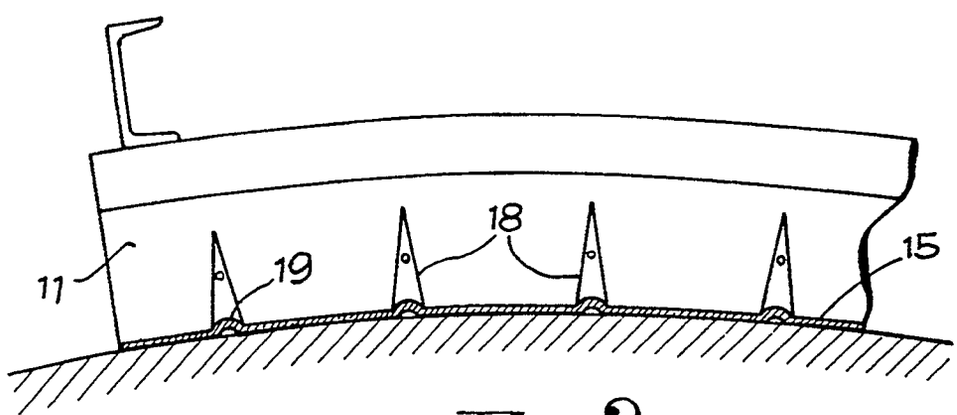


Fig.3

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The present invention relates to equipment for making corrugated and curved concrete surfaces with at least one network, made of fibrillated polypropylene, impregnated and used for reinforcement. More precisely, the invention relates to equipment for forming corrugated and curved slabs which are made up from a number of rubber sticks, placed side by side, shaped in accordance with the corrugated surface required and flexible so as to achieve a longitudinal curve of the surface. The rubber sticks each have a longitudinal recess and suction holes to which pressure is added for holding the surface during its shaping and curving.

Equipment as mentioned above, used for forming corrugated concrete slabs with an impregnated network and curved longitudinally, is already known.

A method for forming corrugated and curved surfaces with a reinforcement network, as will now be described, has already been disclosed in patent application number 5118-A/88 by the same applicant. In accordance with this method, on the side of the corrugated surface most subject to receiving pressure, intermittant folds or beads are formed, during curving, in a transversal direction to that of the curve with reliefs on the opposite side of the surface, especially at the bottom of the depressions or grooves of the resulting surface. Equipment for making said system operable has also been described in the same patent application.

This way of making corrugated and curved surfaces is designated so as to eliminate the forming of wrinkles during the curving of the surface, to only create appropriate deformations in certain area on the surface of the manufactured article which are most subject to receive pressure so as to eliminate all the wrinkles which would otherwise be formed and to consequently make, in corespondence to these areas, folds or beads to reinforce the entire structure and therefore allow for the realization of manufactured articles which are visually and commercially prefered.

Keeping what has been stated in mind, the object of the invention is to install such a method even with a known equipment like mentioned above, but improved so as to obtain folds or beads for eliminating the wrinkles in the desired areas. In this way it is not necessary to use specifically shaped equipment, thus simplifying both the means and technique for shaping corrugated and curved slabs and reducing operation time and costs.

Therefore, in accordance with the invention, along each rubber stick used for forming the equipment as mentioned above, there are intermittant gaps which are designed to hold material for creating, on the corrugated surface which bends, folds or beads protruding on the opposite side of the surface most subject to pressure. Said gaps are cut in a transversal direction on an edge of the sticks designated to define the depressions or grooves of the resulting surface. Said gaps are preferably cut in correspondence with suction holes so that pressure can favour the settling of the material of corresponding areas of the surface in the gaps for the forming of the folds or beads desired.

The attached drawing illustrates an example of a practical realization of the equipment in accordance with the invention.

In said drawing:

Fig. 1 is a practical transversal section view of the equipment formed by sticks on the arrows I-I in fig. 2;

Fig. 2 is a side view of the equipment in a straight form;

Fig. 3 is a side view of the equipment in the condition for forming curved surfaces; and

Fig. 4 is the product as obtained.

The equipment here proposed is made of rubber sticks (11) placed side by side (fig. 1), held by a supporting frame (12) and each having a harmonic-type ribbon (13) which, when pressure is put on the supporting frame (12), allows for its bending, with an elastic return, from a straight position (fig. 2) to a curved one in a longitudinal direction (fig. 3). The rubber sticks (11) each have a side (14) shaped in correspondence with the corrugated surface or slab required. Furthermore, each stick has a longitudinal recess (16) and holes (17) which allow for the application of suction for holding the surface or slab (15).

The ways of moving and using the equipment for forming corrugated and curved surfaces or slabs are known and do not require particular descriptions.

In accordance with the present invention, each rubber stick (11) has gaps (18) designated to create additional folds or beads (19) in the manufactured article. Said gaps (18) are conveniantly spaced and cut in a transversal direction on an edge of the shaped side (14) of each stick (fig. 1) so as to create folds or beads (19), at least at the bottom of the depressions or grooves of the corrugated surface, in a transversal direction to the gaps (fig. 4).

During the bending and forming stages, the material used for the surface or slab tends to enter and settle in said gaps, forming the required folds or beads (19) so as to impede wrinkling in other parts of the manufactured article. Should the gaps (18) be cut in correspondence with certain suction holes of the sticks, the pressure executed on the surface favours the settling of the material in the gaps themselves and therefore the forming on the folds or beads required.

## Claims

**1)** Equipment for forming corrugated and curved surfaces or slabs with at least one reinforcement network, comprising a number of rubber sticks (11) placed side by side, with a side shaped (14) in corres-

pondence with the corrugated surface required and flexible for achieving a longitudinal curve of the surface, each stick having a longitudinal recess and suction holes used for holding and treating the surface during shaping and curving, characterized in that there are also gaps (18) spaced along each rubber stick (11) which are designed to hold material for creating folds or beads (19) in the corrugated surface, where the folds or beads protrude on the side of the surface opposite to the one most subject to receive pressure due to the curving.

**2)** Equipment as claimed in claim 1, characterized in that said gaps (18) are cut in a transversal direction on an edge of the rubber stick designated to define the depressions or grooves of the resulting surface.

**3)** Equipment as claimed in claim 1 and 2, characterized in that said grooves (18) are cut in correspondence with certain holes of each rubber stick.

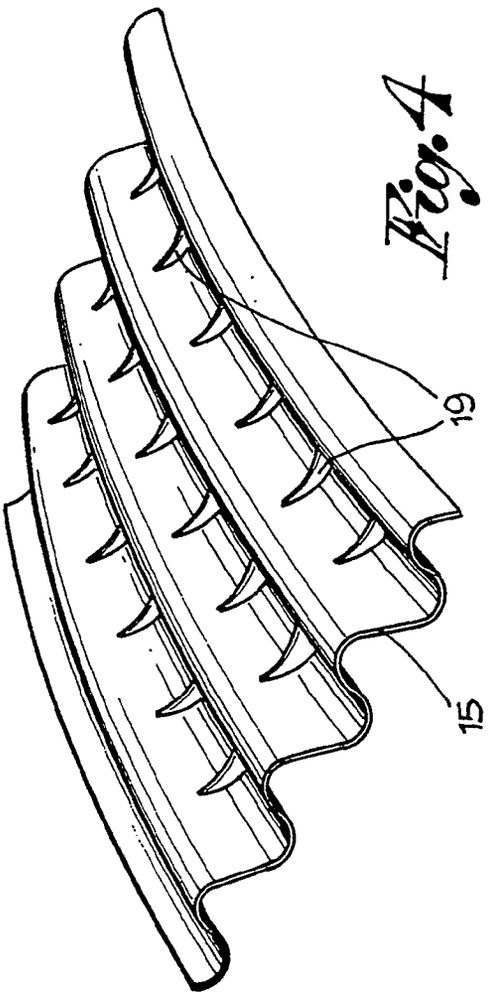


Fig.4

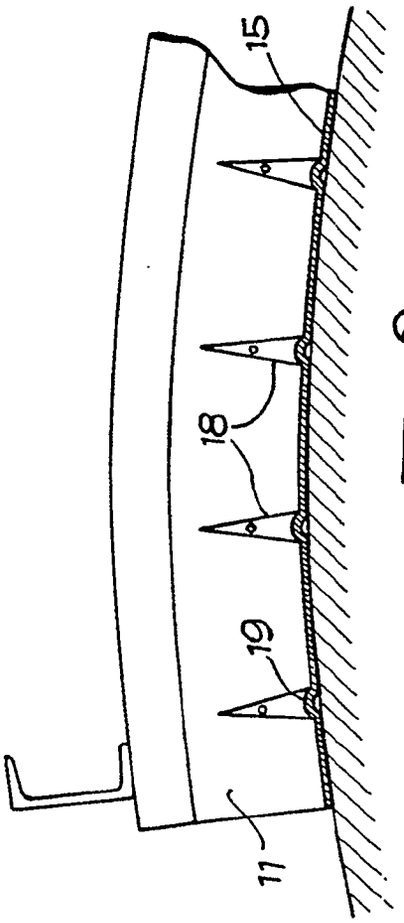


Fig.3

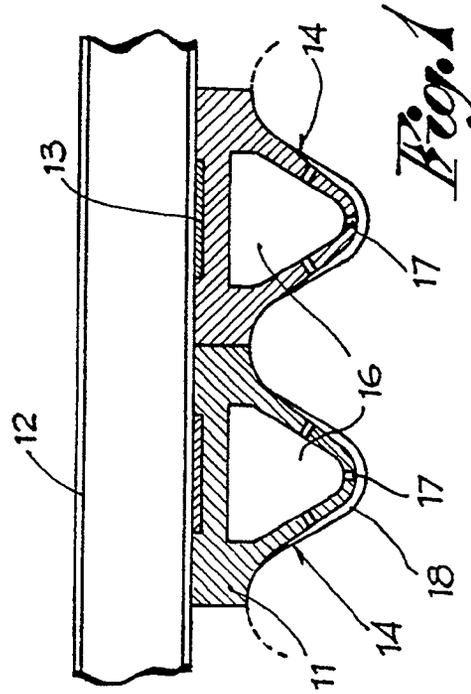


Fig.1

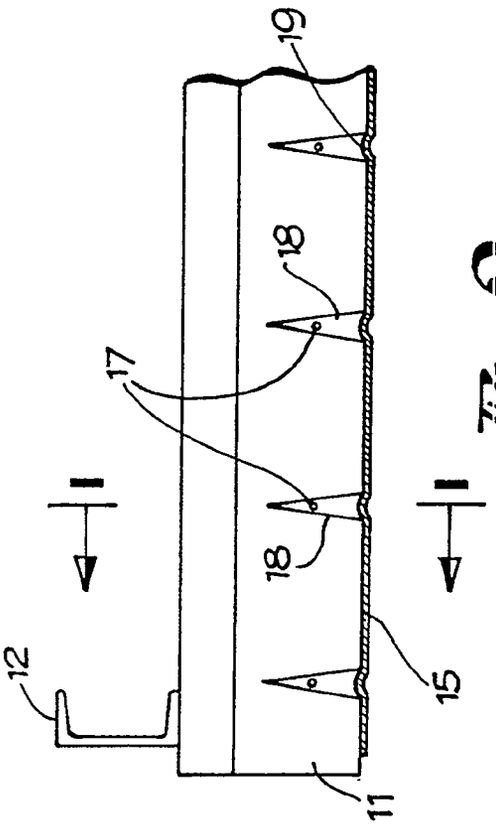


Fig.2

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# EUROPEAN SEARCH REPORT

Application Number

EP 91 83 0029

## 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) |
|---|---|---|---|
| A | EP-A-0 329 619 (SOCIETA ITALIANA LASTRE S.P.A.)<br>* whole document *<br>----- | 1 | B 28 B 1/52 |

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 28 B

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| BERLIN | 08-07-1991 | PAETZEL H-J |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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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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