May 9, 1944. G. GUERCI 2,348,433

CORRUGATED FIBRO-CEMENT SLAB

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Fig. 1

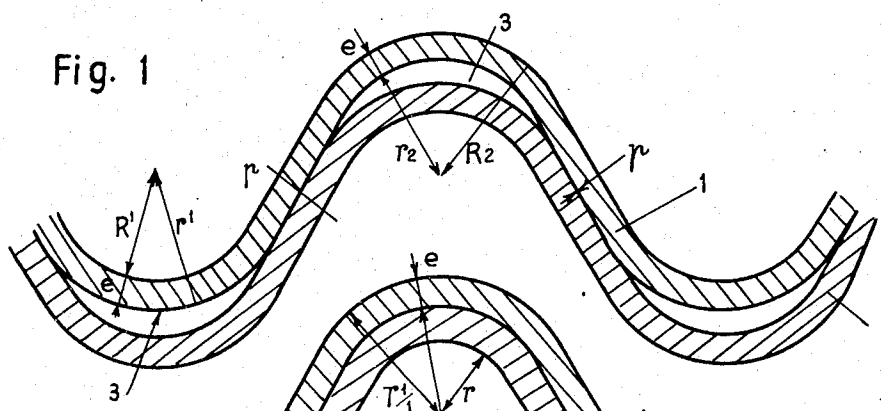


Fig. 2

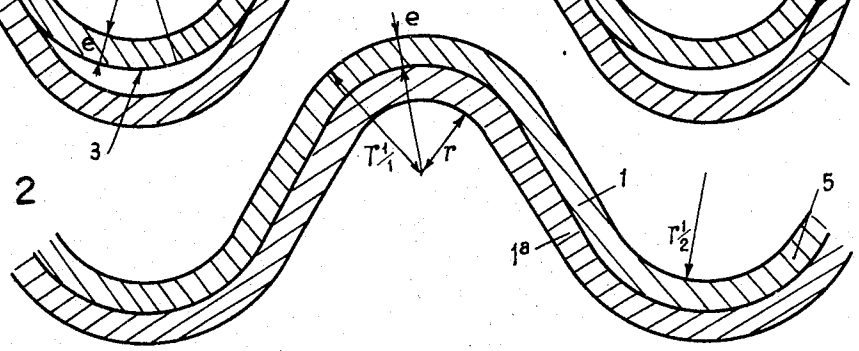


Fig. 3

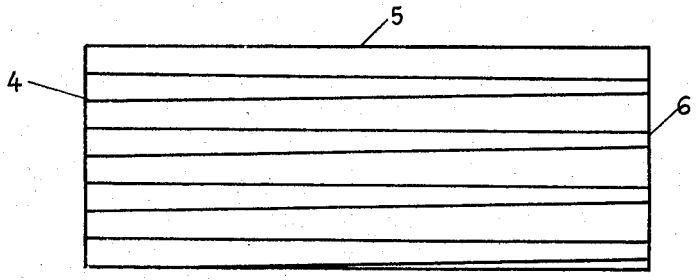


Fig. 4

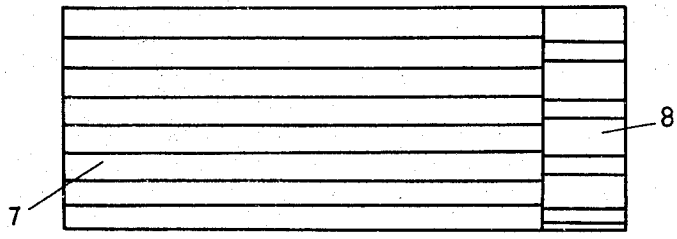
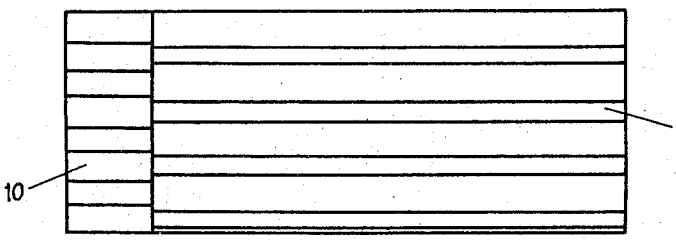


Fig. 5



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CORRUGATED FIBRO-CEMENT SLAB

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Fig. 6

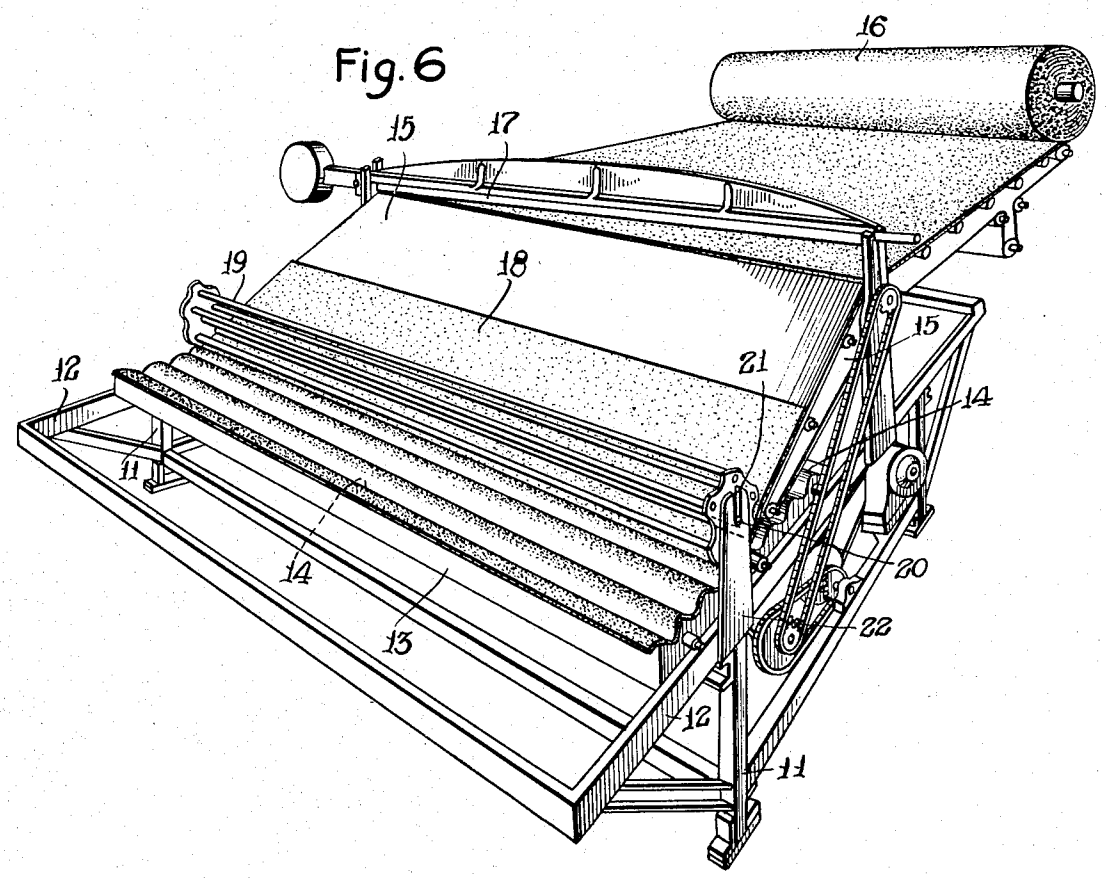
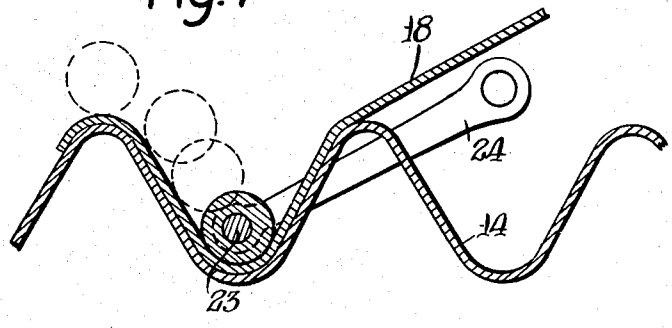


Fig. 7



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Patented May 9, 1944

2,348,433

UNITED STATES PATENT OFFICE

2,348,433

CORRUGATED FIBROCEMENT SLAB

Giovanni Guerci, Turin, Italy; vested in the Alien Property Custodian

Application February 21, 1940, Serial No. 320,200
In Luxemburg February 22, 1939

2 Claims. (Cl. 154—30)

Corrugated plates or slabs of fibro-cement or similar materials, such as are known under the registered names of Eternit, Salonit, and artificial slates, are obtained by arranging the sheet of fibro-cement or the like in a plastic condition, i. e., when it has not yet set, on a corrugated plate constituting the mould or former and forcing material into the grooves thereof by the pressure of members circular in section, generally rods.

This method is unsuitable both from the standpoint of efficiency and quality of the product. The process is obviously a lengthy one and drawing to which the still incoherent material of the sheet is submitted to cause it to flow into the grooves in the mould and fit therein weakens the slab and is often the cause of visible defects that affect its commercial value.

Moreover, the mould is constituted by a corrugated sheet metal which is practically of the standard corrugated type, so that corrugations of the fibro-cement boards are of the normal profile throughout.

However, metal sheets are thin and elastic, so that the top profile does not largely differ from the bottom profile and the sheets perfectly fit on each other when they are superposed, for instance at their ends for making a roof covering.

Corrugated fibro-cement slabs are of a considerable thickness (3 to 8 mm.), so that the radii of curvature of the corrugations on both faces considerably differ from each other. The result is that the superposed portions of the slabs do not match each other, as the projections on one slab rest in the corresponding grooves in the other slab along two generatrices only. Elasticity of fibro-cement being very low, the profiles are not elastically deformed; hence, besides giving a very bad joint, abnormal stresses arise in the overlapping ends of the slabs, that may be the cause of breakage when the plates are overcharged.

It is an object of this invention to eliminate all the above mentioned drawbacks, by providing a machine having a shaped mould, so as to obtain plates with perfectly matching ends and in which the corrugations in the freshly cast sheet are successively formed without generating drawing stresses in the sheet.

According to this invention the corrugated slabs are formed by means of a mould, of which the profile is not the same at both ends, but one end of which is accurately conjugated with the other end. The variation in profile may be a gradual one from one mould end to the other, or one of the profiles may extend only over the portion to be superposed to the end of the adjacent plate.

On forming the fibro-cement slab, the material is placed on an endless band which gradually discharges it into the mould and, as it is deposited thereon, a roller or a roller set, that automatically follow the corrugations, fit the sheet into the corrugations without drawing it in the least.

The accompanying drawings show by way of example a manner of carrying out this invention.

Figure 1 is a cross sectional view of superposed corrugated slabs of the known type;

Figure 2 is a view similar to Figure 1 of corrugated slabs according to this invention;

Figure 3 is a plan view of a slab according to this invention;

Figures 4 and 5 are views similar to Figure 3 showing two modifications.

Figure 6 is a perspective view of a machine for manufacturing corrugated slabs according to this invention and

Figure 7 is a detail view showing a modification of the machine.

Referring to Figures 1 to 5, 1 and 2 denote two corrugated fibro-cement slabs of the known type. The top profile of the corrugations is determined by the radii of curvature R_1 and R_2 merging into each other and the lower profile by the radii of curvature r_1, r_2, which are larger and smaller, respectively, than R_1 and R_2 by the slab thickness e. These profiles are the same throughout the slab length, so that on superposing the two plates 1 and 2 their corrugated portions do not perfectly engage each other, but merely contact on their flanks, theoretically, along two generatrices p, leaving spaces 3 between the apexes of the adjacent corrugations of the two slabs.

According to this invention (Figures 2 and 3), the ends 4 of a corrugated slab 5 is of any standard profile, for instance the same as that of slabs 1 and 2 shown in Figure 1, that is a profile determined by the radii R_1 and R_2 at the outside and radii r_1 and r_2 at the inside; the other end 6 has an outer profile determined by the radii r_1' and r_2' (that is, a profile which espouses the inner profile of the other end), while its inner profile is determined by the radii r and r that are respectively as follows: $r=r_1'-e$; $r^0=r-e$. Change of profile from the end 4 to the end 6 may be a gradual one, as shown in Figure 3, or the standard profile 7 (Fig. 4) may extend over almost all the length of the plate and the con-

jugated profile may extend over a small length 8 at one end of the plate, or, finally (Fig. 5), the conjugated profile may extend over almost all the length 9 of the slab and the standard profile may be limited to an end 10.

The mould, which is of one of the above described profiles, is slidably mounted on the machine shown in Fig. 6; in said figure, 11 denotes the frame of the machine comprising the longitudinal members 12, on which moves a carriage 13 carrying the mould 14 of corrugated sheet metal.

An endless band 15 travels over the mould 14 and the freshly formed fibro-asbestos roll unrolling thereon is fed by the endless band beneath a knife 17 which cuts it into sections 18 of the desired length.

Each section 18 is discharged by the endless band 15 on to the mould 14 which is fed beneath the endless band.

The corrugations in the mould 14 mesh after the manner of a rack with the bars 19 of a squirrel's cage, of which the pivots 20 are engaged by vertical grooves in supports 22 secured to the frame 11.

With this arrangement, as the mould 14 moves beyond the conveyer 15, it receives the fibro-cement section 18, and the bars 19 meshing with the corrugations as the latter are covered by the sheet apply said sheet against the walls of the corrugations, without drawing the material.

According to the modification shown in Fig. 7, the squirrel's cage 19 is replaced simply by a roller 23, loosely mounted at the end of rocking arms 24. The roller 23 follows the profile of the mould and applies against the corrugations the plastic fibro-cement material as described above.

What I claim is:

1. A machine for manufacturing corrugated fibro-cement slabs comprising a frame, means on said frame for supporting a sheet of fibro-cement in a plastic state wound in roll form, a corrugated mould movable on said frame, an endless conveyor for unrolling the sheet from the roll and gradually placing it on said movable mould, a knife on the conveyor for cutting the sheet into portions of the desired length as it moves down towards the mould, a squirrel cage mounted for rotation and vertical displacement at the outlet end of said conveyor and meshing by virtue of its own weight with the corrugations of the mould so as to cause the sheet to conform by the action of the rods of said squirrel cage to the corrugations of the mould without undergoing objectionable tension stresses.

2. A machine for manufacturing corrugated fibro-cement slabs comprising a frame, means on said frame for supporting a sheet of fibro-cement in a plastic state wound in a roll form, a corrugated mould movable on said frame, said mould having at one end a marginal portion of a width corresponding to the overlap of the slabs in their final position, the radius of curvature of the corrugations in said marginal portion differing from the corresponding radius of curvature of the corrugations in the remaining portion of the mould by an amount substantially equal to the thickness of said slab, an endless conveyor for unrolling the sheet from the roll and gradually placing it on said movable mould, a knife on the conveyor for cutting the sheet into portions of the desired length as it moves down towards the mould, a squirrel cage mounted for rotation and vertical displacement at the outlet end of said conveyor and meshing by virtue of its own weight with the corrugations of the mould so that the sheet is caused by the rods of said squirrel cage to conform to the corrugations of the mould without undergoing objectionable tension stresses.

GIOVANNI GUERCI.