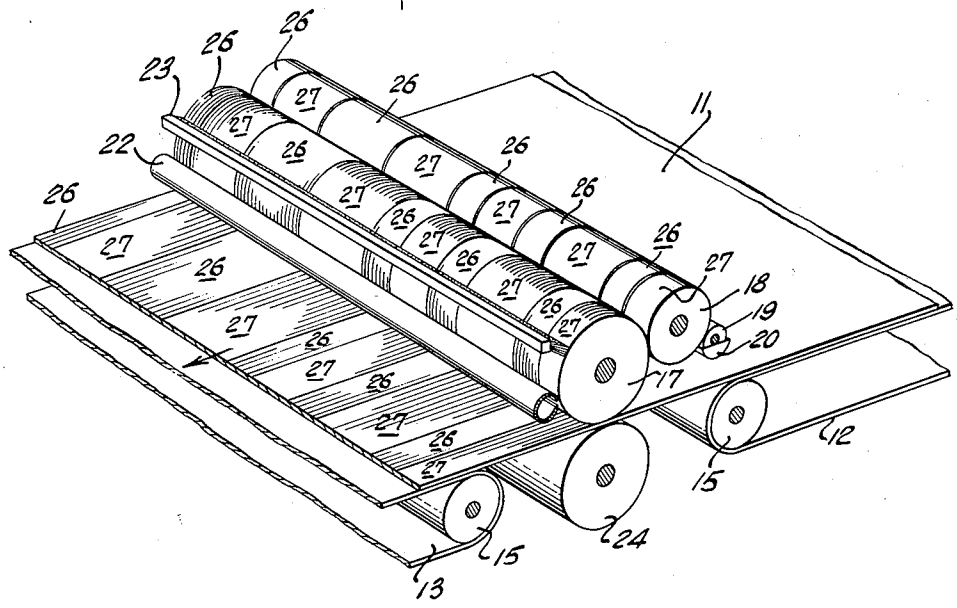
March 22, 1960 B. H. FIELD ET AL 2,929,735

MULTI-COLORED ASBESTOS-CEMENT PRODUCT AND PROCESS

Filed Sept. 17, 1956 2 Sheets-Sheet 1

Fig. 1.



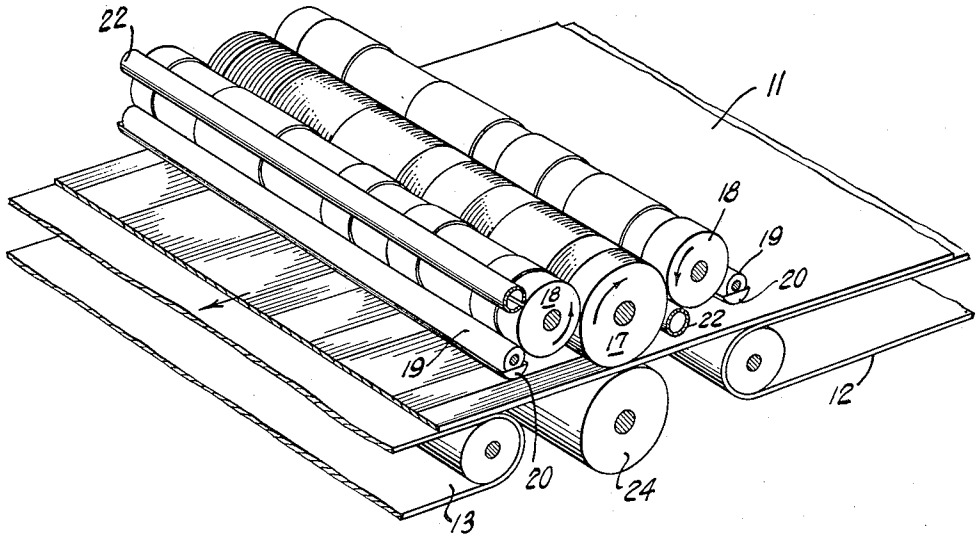


Fig. 2.

INVENTORS:
BRENTON H. FIELD
JOHN W. MAYO
BY
Edward J. Wilby
ATTORNEY

March 22, 1960 B. H. FIELD ET AL 2,929,735

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Fig. 3.

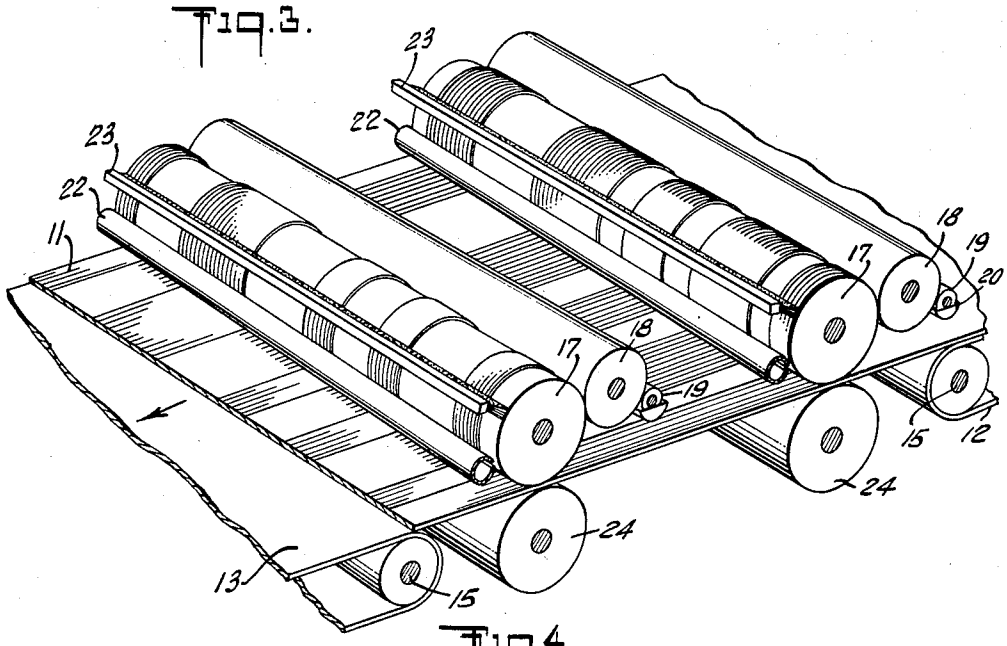


Fig. 4.

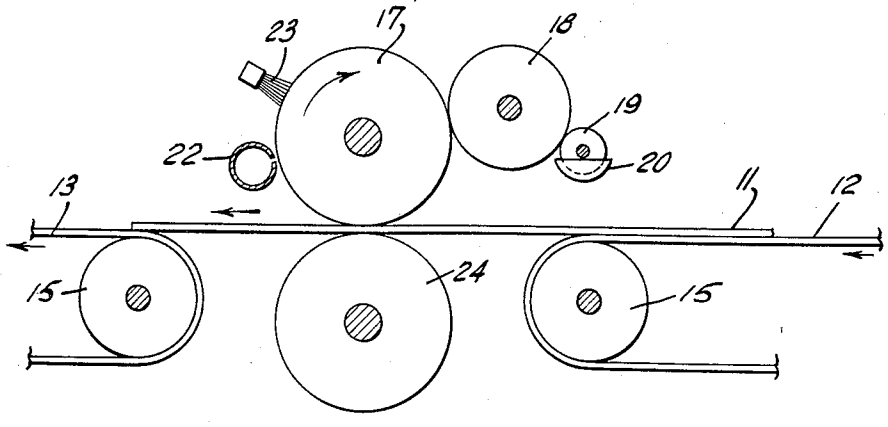
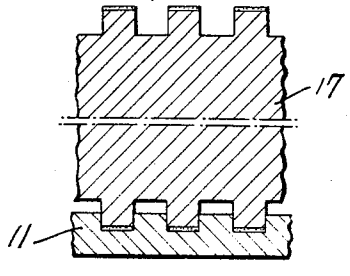


Fig. 5.



INVENTORS:
BRETON H. FIELD
JOHN W. MAYO
BY
Edward J. Willey
ATTORNEY

United States Patent Office

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2,929,735

MULTI-COLORED ASBESTOS-CEMENT PRODUCT AND PROCESS

Brenton H. Field, Chicago Heights, and John W. Mayo, Matteson, Ill., assignors to The Patent and Licensing Corporation, New York, N.Y., a corporation of Massachusetts

Application September 17, 1956, Serial No. 610,363

9 Claims. (Cl. 117—8)

The present invention relates to improved asbestos-cement products and processes for making them and more particularly to asbestos-cement products in sheet form having an improved multi-color surface.

Asbestos-cement products in sheet form and particularly in the form of shingles are a well known and popular method for roofing and siding of houses and other buildings. Asbestos-cement in the form of large sheets has also been used for the exterior wall surfaces of buildings. One of the problems with the material is to give it an attractive decorative appearance applied at the factory at a low cost. The decorative finish should be of a substantially permanent nature since the material itself is designed for extensive periods of use.

It is an object of the present invention to provide an improved asbestos-cement product.

It is a further object of the present invention to provide a method for making an improved asbestos-cement product.

It is a further object of the present invention to provide an asbestos-cement product with an improved surface design.

It is a further object of the present invention to provide an improved asbestos-cement product having on the surface thereof a permanent embossed colored design.

These and other objects are attained by the present invention which provides an asbestos-cement product such as a sheet of asbestos-cement or an asbestos-cement shingle with an improved embossed design of parallel lines having a colored pigmented cement in the valleys of said embossed lines of a color different from the base of said asbestos-cement product and having parallel lines of at least two different colors on the same product.

The improved process generally comprises simultaneously embossing and pigmenting asbestos-cement sheet material while the cement is still wet with at least one embossing roll divided into a plurality of groups of adjacent parallel lines each group of which simultaneously embosses and pigments the asbestos-cement sheet with a colored pigmented material of a different color from that embossed and pigmented by the next adjacent group of parallel lines on the asbestos-cement sheet. This is accomplished by dividing the combined embossing and printing roll or rolls into groups of parallel embossing lines and feeding pigmented cement slurries of at least two different colors to at least two adjacent groups of embossed lines.

The invention may be further understood by reference to the drawings which illustrate preferred embodiments of the invention but it will be understood that variations and substitutions may be made within the scope of the claims.

In the drawings:

Fig. 1 is the perspective view of the equipment for simultaneously embossing and pigmenting more than one color on the asbestos-cement sheet shown passing through the said equipment and process;

Fig. 2 is a view similar to Fig. 1 illustrating an alternative form of the equipment and process;

Fig. 3 is a view similar to Fig. 1 showing a second alternative form of the equipment and process;

Fig. 4 is a diagrammatic cross-sectional view of the equipment and process shown at Fig. 1; and

Fig. 5 is a segmental cross-section view of a segment of one of the embossing rolls and the asbestos-cement product which it is embossing.

With reference to the drawings there is shown a sheet of asbestos-cement **11**, supported on belts **12** and **13** in a wet or plastic condition. These belts operate on pulleys **15—15** and the belts and pulleys are adapted only to convey the wet plastic sheet.

With reference to Fig. 1 there is shown an embossing roll **17**, adapted to contact the asbestos-cement sheet **11**, and simultaneously emboss and pigment it. Adjacent the embossing roll is a pigmenting roll **18**, which transfers pigmented cement from a divided transfer roll **19**, operating in a color pan **20**, which is divided in segments as will be seen from the segments shown on the inking roll **18**. Adjacent the embossing roll and parallel thereto is a vacuum pipe **22**, adapted to be connected to a vacuum pump, not shown, for the purpose of removing excess pigmented cement from the embossing roll after it has contacted the asbestos-cement sheet. There is also provided a brush **23**, located just above the suction pipe and parallel thereto for the purpose of further cleaning. The cleaning is important since otherwise the pigmented cement may get into the valleys of the embossing roll and subsequently appear on the crests as well as the valleys of the finished product. Alternative methods of cleaning, however, may be used and one such device which has been found successful is a comb which has teeth corresponding to the valleys in the embossing roll. Below the embossing roll there is preferably a press roll **24**, adapted to keep the asbestos-cement sheet in firm contact with the embossing roll. For a clearer understanding of the operation the transfer roll, embossing roll and the asbestos-cement product have been designated by the numerals **26** and **27** to indicate areas of two different colors. It will be understood that the number of colors may be varied and the widths of the bands of each color may be varied.

An alternative device is shown at Fig. 2 wherein the color pan **20** is not segmented and for a two-color design two color pans, two transfer rolls and two pigmenting rolls are utilized.

Fig. 3 discloses an alternative device for two-color work wherein the color pan **20** is not segmented and there are two embossing rolls operating in complement to each other and being free of embossing surface in certain areas. This device, while somewhat more complicated mechanically, is particularly desirable for the purpose of providing a completely clean color-distinct product.

With reference to Fig. 5, it will be seen that each segment of the embossing roll has parallel embossing rings which simultaneously emboss and pigment the wet asbestos-cement sheet. When the pigmented cement is properly applied and the roll is properly cleaned the pig-

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mented cement will appear only in the valleys of the asbestos-cement sheet. This provides a product which is not only attractive but wherein the pigmented cement is away from the surface and does not wear off or become smeared during handling of the product. It will be understood that only a design of straight parallel lines is thus produced. This is desirable among other things for masking joints between shingles. The embossing is preferably a square cut depression with pigment only at the bottom and with clean side walls. The product thus clearly distinguishes from any which are first embossed and then filled with pigment.

In applying the process to asbestos-cement shingles there may be utilized any of the known methods for producing asbestos-cement shingles. These generally involve the wet process wherein the asbestos-cement is applied to a felt by means of one or more cylinders and the material is transferred from the felt to an accumulator roll from whence it is cut when a sufficient thickness has been built up. With this method a top layer of a veneer of light colored asbestos-cement is often used. It is on this top layer of veneer while still wet that the embossed design is preferably applied. It is further applicable to the dry process wherein the dry ingredients are placed on a conveyor and water added. This material may then be passed under an embossing roll while still wet, as described above. The sheet is then passed through a cutter which divides the sheet into shingles of a desired size.

It will be understood that the relative size of the embossing rings may be varied so that narrow and wide lanes of embossing may be obtained. It will also be understood that a plurality of colors may be used and that they may be arranged in various groupings as desired.

We claim:

1. An improved asbestos-cement sheet comprising a base sheet having on one surface thereof a plurality of narrow perfectly parallel embossed straight lines of rectangular cross-section having at the bottom only of the embossings colored pigment the colors of the pigment in at least two adjacent embossing lines being different from each other and different from the base sheet.

2. An improved asbestos-cement sheet comprising a base sheet having on one surface thereof a plurality of narrow perfectly parallel embossed straight lines of rectangular cross-section having at the bottom only of the embossings colored pigment the colors of the pigment in a group of several adjacent embossing lines being different from the color of the pigment in the next adjacent group of several embossing lines and different from the base sheet.

3. An improved asbestos-cement shingle comprising a base sheet having on the exposed side thereof a plurality of narrow perfectly parallel embossed straight lines of rectangular cross-section having at the bottom only of the embossings colored pigment the colors of the pigment in a group of several adjacent embossing lines being different from the color of the pigment in the next adjacent group of several embossing lines and different from the base sheet.

4. A method for producing an improved asbestos-cement sheet having on one surface thereof a plurality of narrow parallel embossed straight lines having at the bottom only of the embossings colored pigment the colors of the pigment in a group of several adjacent embossing lines being different from the color of the pigment in the next adjacent group of several embossing lines and different from the base sheet, which method comprises simultaneously embossing and pigmenting alternate groups of colored lines across the width of the sheet by means of an embossing roll having similarly divided groups of embossing and pigmenting lines thereon.

5. A method for producing an improved asbestos-cement sheet having on one surface thereof a plurality of narrow parallel embossed straight lines having at the bottom only of the embossings colored pigment the colors

of the pigment in a group of several adjacent embossing lines being different from the color of the pigment in the next adjacent group of several embossing lines and different from the base sheet, which method comprises simultaneously embossing and pigmenting alternate groups of colored lines across the width of the sheet by means of a plurality of embossing rolls each having similarly divided complementing groups of embossing lines thereon.

6. A method for producing an improved asbestos-cement sheet having on one surface thereof a plurality of narrow parallel embossed straight lines having at the bottom only of the embossing colored pigment the colors of the pigment in a group of several adjacent embossing lines being different from the color of the pigment in the next adjacent group of several embossing lines and different from the base sheet, which method comprises simultaneously embossing and pigmenting alternate groups of parallel straight lines across the width of the sheet by means of an embossing roll having embossing lines of similar character across the width of the roll, which embossing roll is fed pigmented cement of different colors to alternate groups of the embossing lines and wherein there is means in contact with the embossing roll for continuously cleaning pigmented cement from the valleys in the embossing roll.

7. A method for producing an improved asbestos-cement sheet having on one surface thereof a plurality of narrow parallel embossed straight lines having at the bottom only of the embossings colored pigment the colors of the pigment in a group of several adjacent embossing lines being different from the color of the pigment in the next adjacent group of several embossing lines and different from the base sheet, which method comprises simultaneously embossing and pigmenting alternate groups of parallel straight lines across the width of the sheet by means of an embossing roll having embossing lines of similar character across the width of the roll, which embossing roll is fed pigmented cement of different colors to alternate groups of the embossing lines and wherein there is means in contact with the embossing roll for continuously cleaning pigmented cement from the valleys in the embossing roll, such means comprising a vacuum applied to the surface of the roll and a brush applied to the surface and valleys in the roll.

8. A method for producing an improved asbestos-cement sheet having on one surface thereof a plurality of narrow parallel embossed straight lines having at the bottom only of the embossings colored pigment the colors of the pigment in a group of several adjacent embossing lines being different from the color of the pigment in the next adjacent group of several embossing lines and different from the base sheet, which method comprises simultaneously embossing and pigmenting alternate groups of parallel straight lines across the width of the sheet by means of an embossing roll having embossing lines of similar character across the width of the roll, which embossing roll is fed pigmented cement of different colors to alternate groups of the embossing lines by means of a divided pigment trough and correspondingly divided transfer rolls and wherein there is means in contact with the embossing roll for continuously cleaning pigmented cement from the valleys in the embossing roll.

9. A method for producing an improved asbestos-cement sheet having on one surface thereof a plurality of narrow parallel embossed straight lines having at the bottom only of the embossings colored pigment the colors of the pigment in a group of several adjacent embossing lines being different from the color of the pigment in the next adjacent group of several embossing lines and different from the base sheet, which method comprises simultaneously embossing and pigmenting alternate groups of parallel straight lines across the width of the sheet by means of an embossing roll having embossing lines of similar character across the width of the roll, which em-

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bossing roll is fed pigmented cement of different colors to alternate groups of the embossing lines by means of a plurality of pigment troughs in contact with a corresponding plurality of transfer rolls divided into complementing areas of contact with the embossing roll corresponding to the groups of colored embossed lines and wherein there is means in contact with the embossing roll for continuously cleaning pigmented cement from the valleys in the embossing roll.

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