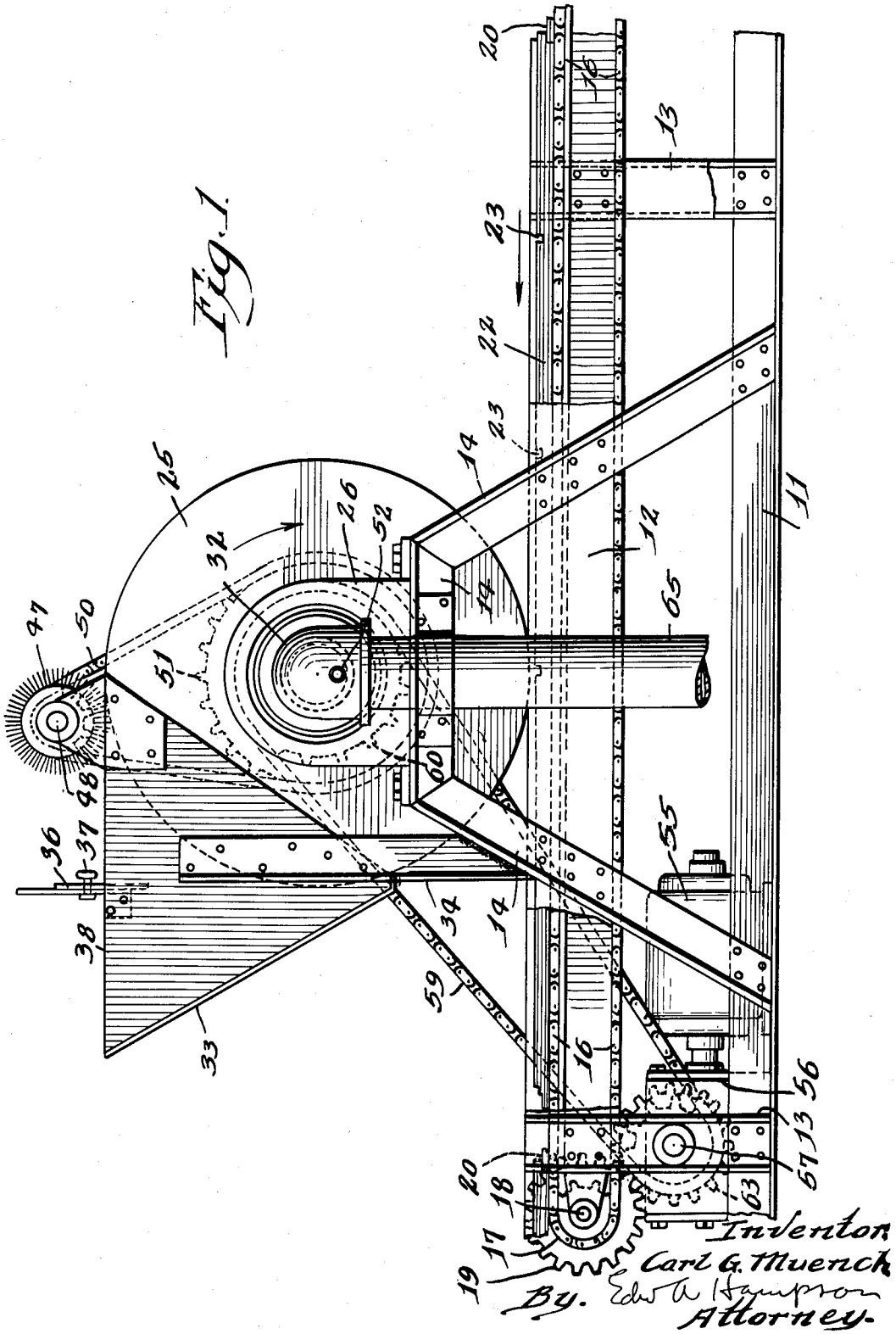
Dec. 27, 1955 C. G. MUENCH 2,728,685

METHOD OF APPLYING GRANULES TO SIMULATE A MASONRY PATTERN

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Fig. 1.



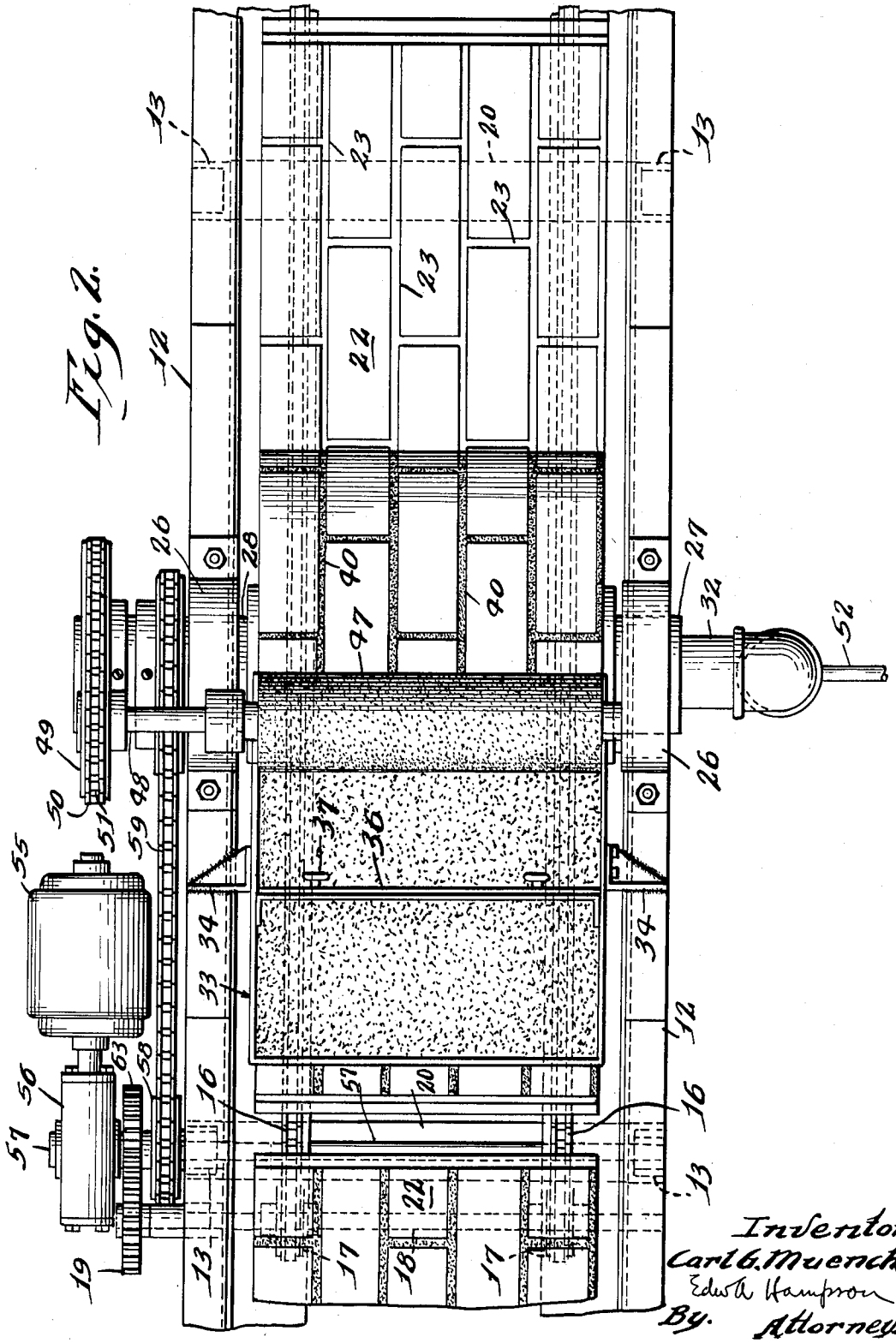
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Fig. 2.



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Fig. 3.

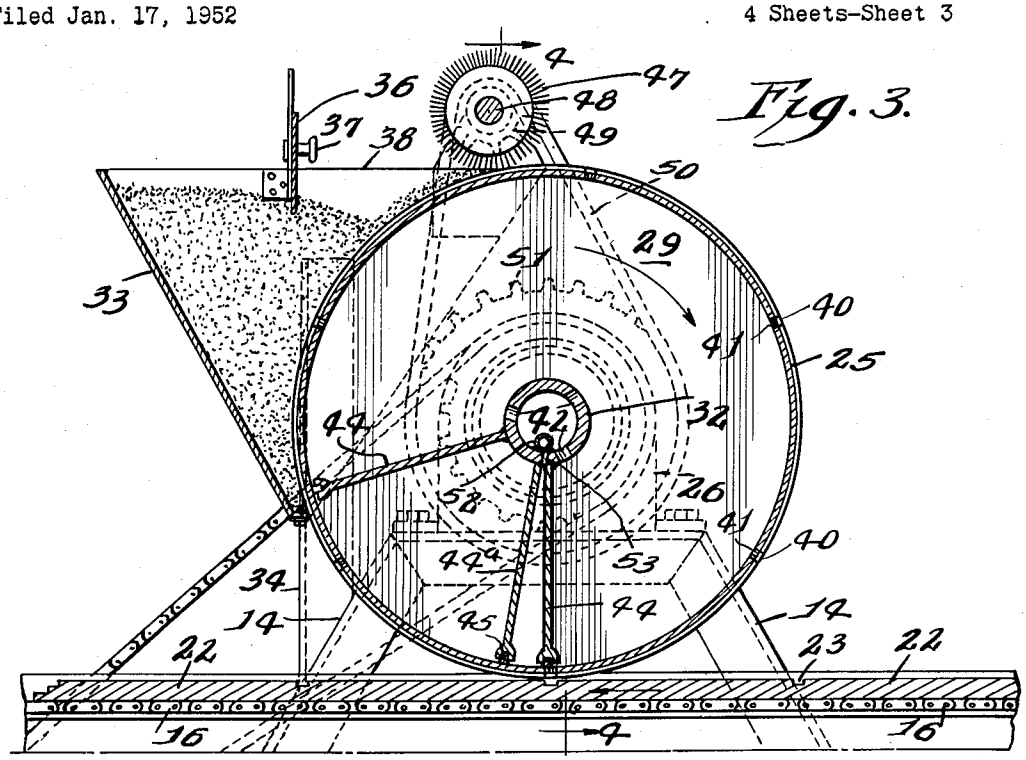
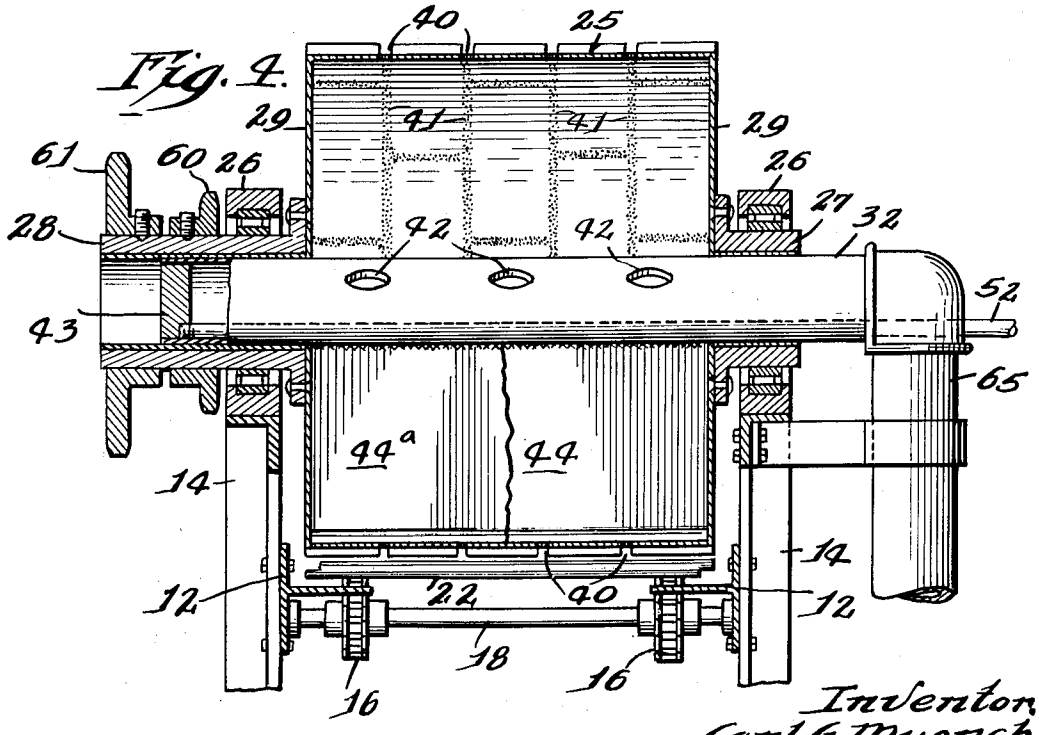


Fig. 4.



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Fig. 5.

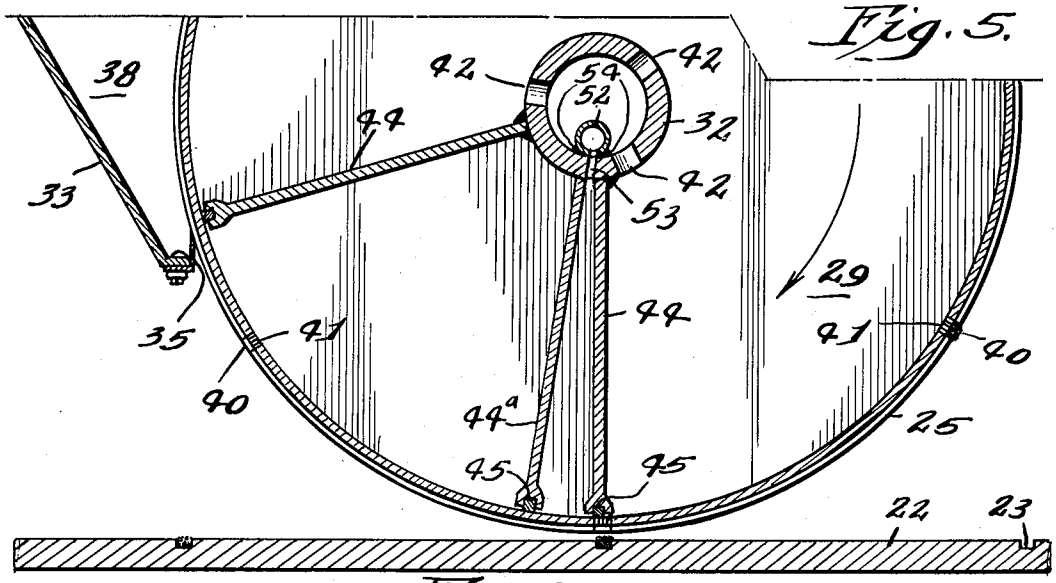
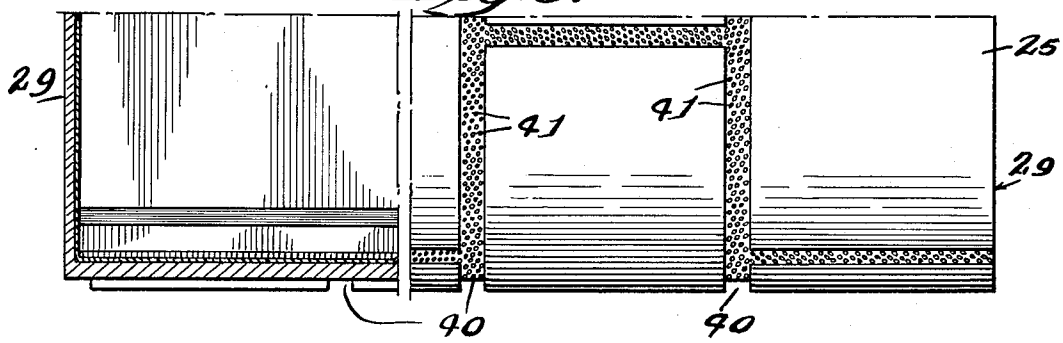


Fig. 6.



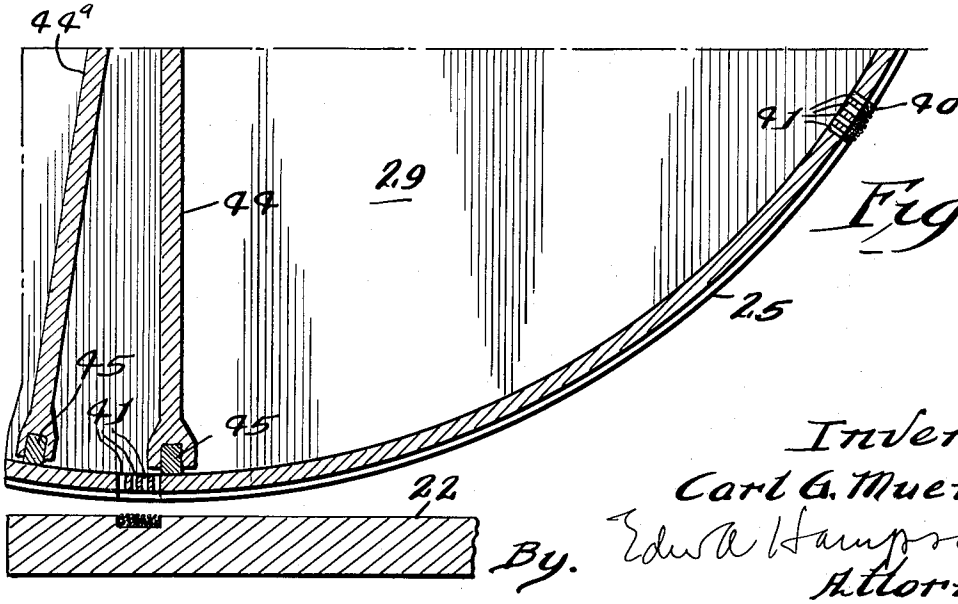


Fig. 7.

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METHOD OF APPLYING GRANULES TO SIMULATE A MASONRY PATTERN

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Application January 17, 1952, Serial No. 266,881

3 Claims. (Cl. 117—25)

This invention relates to a new method for use in the manufacture of insulating siding, wherein there are provided mortar simulating lines and it has to do specifically with a method for depositing or applying a contrasting material in proper quantity and in the correct placement to provide the desired mortar simulating lines between the surface elements of such product.

Insulating sidings are manufactured by the general procedure of saturating the surfaces of a suitable sheet of fiber insulating board with asphalt and with subsequent application to a surface of suitable granular material to simulate the type of surfacing desired—as, for example, to simulate brick, stone, or the like. In the usual procedure of manufacture, after the basic surface granules have been applied to a soft asphalt coating on the face of the base sheet, the such coated sheet is passed under a branding roll on which there is an upstanding pattern of the desired mortar simulating lines, and where the mortar lines are to appear the such branding roll presses the granules into and submerges them in the asphalt coating on which they have been applied. The result of this general procedure of manufacture, it will be evident, produces a sheet on the face of which there are face elements of adhered granules and between which there are mortar simulating lines which are black due to the fact, as before stated, that the granules on these portions of the face have been pressed into and submerged in the asphalt coating so that what is seen at the mortar lines is the black color of the asphalt coating. It is desirable, to obtain an actual simulation of brick work, stone work, or the like, that there be applied in the mortar line pattern colored granules to simulate a mortar line appearance of real brick work, stone work, or the like, and the apparatus hereof has been developed for the purpose of applying to the mortar line pattern the desired material of a contrasting color to simulate actual mortar lines between the individual face elements, simulating brick, stone, or the like.

In the normal process of production of insulating sidings, it is necessary that the base sheets being processed be run in one position only; that is, they pass through the manufacturing process in a horizontal position with the same face up at all times, and which is necessary due to the fact that the surfacing granules are applied to and adhered in a rather heavy coating of hot asphalt, with the result that this surface must be kept upwards at all times during the processing as it is in a quite plastic condition and it would slide or be displaced if any attempt were made to invert the sheet for processing with the treated surface turned downwardly.

Various devices have been tried for applying contrasting material to the mortar line simulating pattern in manufacturing this type of product. For example, one manner in which such has been applied is by the application of a layer of the contrasting material over the entire upper surface of the sheet with subsequent operations for sucking off, as by vacuum, the excess material which does not adhere in the mortar joint simulating lines, or

by blowing off the excess, or by a combination of suction and blowing to remove the excess. Such procedure is not satisfactory in that there are always sufficient voids or openings or exuded adhesive here and there between granules of the element simulating faces, so that some of the contrasting material adheres to the adhesive layer at such points within the area of the individual unit simulating surfaces, and the product consequently has a somewhat speckled effect. Efforts have also been made to apply the mortar simulating material only in the mortar joint lines with subsequent pressing, as by a roll with a suitable pattern on the surface, but it has been found that the contrasting material deposited in the mortar joint lines flows over the edges of the mortar line recess, or is somehow forced over the edges in the pressing operation, with the result that some of these contrasting granules are adhered in the overall pattern of granules with a very disfiguring effect.

It is a particular object of this invention to provide an apparatus which will accurately deposit contrasting mortar line simulating material within the confines of the mortar line recess, and which will provide for securing such material in the mortar line recess without deposit of such material on the background field, so that there is no chance that any such contrasting material may be adhered within the background field and thus the marring or disfiguring effect resulting therefrom will be avoided. Also it is an object hereof to provide such an apparatus which can be used in a continuous process of production of the product, the operation of which is simple and the apparatus itself is what might be termed "foolproof."

In the accompanying drawings, wherein the inventions hereof are disclosed,

Figure 1 is a side elevation of the apparatus;

Figure 2 is a top plan view;

Figure 3 is a vertical sectional view of the transfer roll and associated parts of Figure 2;

Figure 4 is a sectional view taken on the line 4—4 of Figure 3;

Figure 5 is an enlarged detail section of a portion of the transfer roll and associated parts;

Figure 6 is an enlarged detail view showing a part of the transfer roll surface; and

Figure 7 is a detail view on a still larger scale than Figure 5 and showing in section a portion of the transfer roll and associated parts.

The apparatus hereof is particularly for use in a continuous line production process for the production of insulating siding which is provided with a contrasting mortar line pattern.

Insulating siding generally comprises a sheet of fiber insulating board one-half inch thick and about 12" x 48" as the base or core thereof. It is to be understood, of course, that the size of the base sheet may vary with different manufacturers, but it is generally of a size of or about as stated. In the manufacture of the product the base sheet is submerged or otherwise surface-saturated with asphalt to a limited depth, and then an asphalt coating is applied to one surface, the upper surface in the process of manufacture. Suitable granular material is then applied to the adhesive asphalt surface coating and suitably embedded or adhered to the asphalt coating, with any excess or unadhered particles removed generally while passing under suction nozzles. The sheet so prepared with an overall background or surface of adhered granules is then passed under a suitable branding roll on the surface of which there is provided the desired configuration or pattern to press the surfacing granules into or submerge such granules in the adhesive coating along the lines corresponding to the pattern provided on what is usually termed the "branding" roll.

It is usual that insulating siding is provided either

with a brick pattern or a stone work pattern, that is, a simulation of brick work or stone work, according to the particular pattern which has been adopted by the particular manufacturer. When the background surfacing is submerged in the adhesive coating as by branding, as has been referred to, the unit then displays a surface which comprises a simulation of brick work or stone work or other desired simulation in which the individual units or unit elements or faces thereof are simulations of a structural material separated by simulated mortar lines which are black, since along these lines, as has been described, the asphalt coating has been brought to the surface by the branding operation.

Since a black mortar line between bricks or stone or the like is not a normal color for the mortar joint between such units or elements, it is desired to apply a colored mortar line simulating material between the individual elements or units, as, for example, white or slightly buff colored granules applied along these mortar line joints and adhered therein by the asphalt which is there exposed, as has been described. The device hereof has been developed especially for the purpose of depositing and securing in the mortar line recesses between individual elements or units suitably colored material, usually in granular form, so as to simulate mortar line joints of suitable and usual color between the individual units or elements.

For the purpose of applying the contrasting mortar line material in the process of continuous production of the fiber insulating siding units, there is provided the apparatus disclosed in detail in the drawings, wherein such apparatus is assembled to a suitable supporting structure in which there is a base rail 11, a top rail 12, spacer members 13 and a roll supporting construction designated generally by numeral 14. The specific construction of this supporting framework is relatively immaterial and is merely referred to for the purpose of providing a complete description and understanding of the apparatus. On upper rail 12 there is suitably mounted a conveyor for conveying units which have been surface-saturated and coated and to which the granule background surface has been applied and branded. The conveyor for conveying the units through the apparatus hereof comprises the conveyor chains 16, the outer ends of which run over suitable chain driving sprockets 17 mounted on conveyor drive shaft 18, which in turn is suitably journaled to the upper rail member 12 and is driven by spur gear or equivalent, 19. Mounted on conveyor chains 16 there are provided cross members 20 which are adapted to receive a unit and carry it through the apparatus hereof.

For the purpose of applying a suitable material of the desired color in the mortar line depressions in the faces of the insulating siding units 22, the mortar line depressions being shown in 23, there is provided the apparatus as will now be described.

On a suitable supporting frame 14 there is journaled a roll 25 which is mounted in journals or bearings 26. These bearings 26 are journaled to annular members 27 and 28, respectively, secured to the opposite end faces 29 of roll or cylinder 25. A pipe line member 32 extends through the annular members 27 and 28, and roll 25 is in effect journaled on such pipe member 32 and in bearings 26, the purpose of which construction will subsequently become apparent.

Roll 25 is a closed roll or drum member comprising the circumferential shell and end members 29 so that suction may be applied to the interior thereof, as will be hereinafter described.

A hopper 33 is associated with the roll 25, being suitably supported by supports such as 34 mounted to the heretofore described framework of the apparatus.

Hopper 33 comprises an inclined wall which extends transversely across the width of the apparatus together with side members 38 which embrace the cylinder ends 29 to form an open-sided V-like trough, one side of which is closed or completed by roll 25 which is embraced by the hopper side members 34. At the bottom of the inclined transverse wall of the hopper there may be provided a flexible seal 35 which is suitably secured to the inclined wall member and seals against the surface of roll 25. Positioned across the hopper near the top there may be provided an adjustable gate 36 secured in adjusted position by a locking member 37.

The face of the roll 25 is provided with a suitable brick pattern, stone pattern, or the like, as may be desired, and between the individual units thereof is recessed, as at 40, which recesses correspond to the mortar lines in the product being produced. The recesses 40, it will be apparent, extend only partly into the shell or face of the roll, and in the base of such recesses there are provided small openings 41 which may be small drilled holes or other equivalent which will provide for communication between the such recesses 40 and the interior of roll 25. Pipe 32 heretofore referred to, and which extends through the annular roll journal members 27, is provided with openings 42, whereby a vacuum pump or the like connected to pipe 32 may exert a vacuum or suction on the interior of roll 25 which, of course, communicates through openings 42 to the roll shell, and as a consequence exerts a suction or vacuum effect in recesses 40. Pipe member 32, adjacent its outer end, is provided with a suitable plug, such as 43, so that the suction effect as referred to may be applied to the interior of roll 25.

Also within roll 25 and mounted on pipe 32 there are provided partition members 44 which are secured to the pipe member in any suitable manner, as by brazing, or the like, or by any mechanical equivalent thereof. At their outer ends these partition members 44 are provided with suitable sealing means, such as the strips 45, which are mounted to members 44 and which provide a seal between members 44 and the interior surface of roll shell 25. These partition members are spaced one positioned substantially on the center vertical line through the axis of roll 25 and the other angularly spaced therefrom to contact the interior surface of roll 25 at a point approximately at the level of the lower end of hopper member 33, the angle between such partition members 44 being in the specific illustration approximately 80°. The purpose of these partition members 44 is to seal off a portion of the interior of roll 25 from the effection of the suction or vacuum exerted through pipe 32 and the openings therein 41, so that atmospheric pressure may be maintained in the portion of the interior roll which is encompassed between the such partition members 44. It is to be noted that the openings or holes in the pipe member 32 are so positioned that none of them open from the pipe into the space encompassed between the partition members 44, and thus it would be evident that the interior of the roll 25 will be subjected to suction or vacuum throughout the major portion of the volume thereof except for the space encompassed between the partition members 44 from which such vacuum or suction is sealed by partition members 44 and sealing members 45, and wherein due to communication of the portion with the atmosphere through openings 41 such portion of the interior of the cylinder will be subjected to atmospheric pressure.

Mounted above roll 25 in suitable bearings there is a brush 47 which is mounted substantially at the point where roll 25 emerges from the hopper member, which brush roll is mounted on shaft 48 on which there is provided a driving sprocket 49 which is driven by a chain 50 in turn driven by sprocket 51 mounted on one of the annular members secured to a cylinder end 29. It is to be understood that the specific drive is immaterial, and that any other equivalent drive may be employed to suitably drive this brush roll which serves to brush any excess granules from the surface of cylinder member 25 as it emerges from the hopper 33, as will be hereinafter more fully referred to.

For driving the apparatus there is provided a suitable source of power operating at the desired speed, and such may, for example, comprise motor **55** and speed reducer **56**. Shaft **57**, which is suitably mounted to the frame members **13**, is driven from speed reducer **56**, and mounted on this shaft **57** there is provided a sprocket **58** which drives chain **59** in turn mounted on sprocket **60** which drives the main roll **25**. Sprocket **60** is mounted on the annular member **28** which is mounted to roll **25**, and there is also mounted to such annular member **28** a second sprocket **51** which drives chain **50** trained over brush roll sprocket **49**. Also mounted on shaft **57** there is provided a gear **63** which meshes with gear **19** which, as heretofore described, drives the conveyor chains **16**.

Suitable vacuum or suction may be applied to the interior of roll **25** through pipe **32** by connected pipe **65** which will extend to and connect to a suitable source of suction or vacuum.

In the operation of the apparatus prepared blanks, which have been previously surface-saturated, and surface-coated, and to the upper surface of which the desired background granules have been applied but with the adhesive surface coating exposed at the mortar line pattern **23**, as by appropriately submerging the background granules along such mortar line joints lines **23**, are placed on conveyor chains **16** whereupon, with the machine operating, the cross members **20** properly position the prepared blanks on the chains to carry them through the apparatus in registration with the rotation of roll member **25**.

It will be readily understood that roll member **25** has a circumference somewhat in excess of the length of the individual units **22**, such being equal to the length of a unit **22** plus the distance which such units are spaced on conveyor **16** in accordance with the positioning of cross members **20** thereon. This spacing between the units **22** on the conveyor is the arcuate distance encompassed between the partition members **44** which are positioned within roll **25**. As a consequence of the fact that the entire device is driven from a single power source through suitable gearing, chains and sprockets, the unit **22** will be carried through under roll **25** in register therewith to register the recessed pattern **40** provided in the surface of the roll, which pattern **40** is the same as the pattern of the mortar line lines **23** provided in the face of the unit **22**.

Suitable contrasting granular or particulate material is supplied to hopper **33**, and as roll **25** is rotated, the recessed surface pattern **40** thereof will be filled with such contrasting material and will be retained in the pattern recesses **40** due to the suction existing within roll **25** and exerted thereon through the small openings **41** which communicate from the interior of roll **25** and the base or bottom of the pattern recesses **40**. As the roll **25** rotates, any excess of the contrasting granular material on the surface of the roll or protruding at the recesses **40** above the surface of the roll will be brushed off by the rotating brush **47**, so that as any particular recess **40** passes the brush, the recess will be just full of the contrasting granular material. Due to the fact that the suction continues to be exerted through openings **41** as roll **25** rotates, the contrasting material in the recesses **40** will be held therein until the recessed portion reaches the position at substantially the vertical, passing through the center line of the roll, that is, until any such particular point reaches the forward edges of the seal members **45** in the vertical partition member **44**. At such point the suction from the interior of the roll is cut off by the seal members **45** and such suction no longer being effective to retain the contrasting material in the groove **40** at such position, the contrasting material will be deposited in the registering mortar line groove **23** in the face of unit **22** since, as above stated, the mortar line pattern of recesses **40** in roll **25** are the same as or a reproduction of the pattern of

mortar line recesses **23** in a unit, and since the movement of the roll and unit is synchronized, the contrasting granular material will be deposited from the pattern on the roll surface into the mortar line pattern on the surface of the unit. The mortar line depressions **23** having adhesive therein, as previously described, that is the material of the adhesive coating which had been applied to the surface of the unit **22**, it results that the contrasting material which is deposited from the roll **25** in such mortar line pattern **23** of the unit will be adhered in such mortar line pattern **23**, and unit **22** will be provided with the desired contrasting mortar line pattern.

It may be desired to positively propel granules as they are discharged or released against or into the mortar joint lines **23** just as or immediately subsequent to their discharge or release from grooves **40** of roll **25**. To accomplish such purpose there accordingly may be provided a third partition member **44*a*** positioned within the roll **25** and secure to and extending substantially outwardly radially from pipe member **32** and which may, at its outer end, be provided with a sealing strip **45** similar to those provided in the outer ends of partitions **44**, as heretofore described.

For supplying air under pressure to the narrow space just preceding, in the direction of rotation, the partition **44** which extends substantially vertically downward, and defining between such partition **44** and the above-referred to partition **44*a***, a pipe or pipe-like member **52** is positioned within suction pipe member **32**, which pressure pipe **52** is preferably welded or otherwise sealed to the interior surface of pipe **32** as by continuous bead welds **54** or the like. With the construction just described it is evident that holes or passages **53** may be drilled through walls of pipes **32** and **52** to provide communication between the interior of pipe **52** and the space encompassed between partition members **44** and **44*a***, above-referred to, whereby with air under pressure in pipe **52** the such space between the partitions will be subjected to such positive air pressure. In connection with the foregoing, it should be readily evident that in the rotation of roll **25** just as any point in the circumference thereof reaches the seal of the substantially vertical partition **44**, the suction is cut off from the groove **40** at such point, and that as such point passes the seal **45** the groove **40** then at that point will be subjected to positive air pressure due to air under pressure flowing through the small openings or holes **41** provided at that point, and that consequently granules at such point will be positively deposited in grooves **23** under the effect of such positive air pressure. It is, of course, understood that pipe member **52** will at some point outside of roll **25** pass through the wall of pipe **32** and may be connected to any suitable source of air under pressure.

Although not previously mentioned, it should be readily apparent that the partition **44** which is spaced from the substantially vertically, downwardly extending partition **44** need not necessarily be positioned at about 80° therefrom, as shown in Figure 3, but, if desired, such second partition **44** may be spaced up to substantially 180° therefrom, or anywhere up to the position of brush roll **47**, in connection with which, of course, suction ports **42** in pipe **32** must be appropriately relocated.

What I claim is:

1. The method of applying contrasting granules in a pattern to board-form sheet material and comprising the steps; supplying such granules to a surface in the desired pattern, temporarily securing the granules to such surface by application of suction thereto by way of openings extending through such surface, bringing such pattern of granules into depositing relation to the board-form sheet to which they are to be applied and discontinuing the suction effect whereby the granules are released and deposited in the desired pattern on the board-form sheet.

2. The method of transferring contrasting discrete particles from a heterogeneous supply and depositing them in a predetermined pattern and comprising the steps; supply-

ing such particles to and filling a predetermined pattern of grooves, applying suction in such grooves and retaining the particles therein, successively transferring succeeding increments thereof to succeeding preplanned points for deposit thereof, beginning at a predetermined point, progressively discontinuing the suction applied to the grooves and to thereby release the granules for deposit in successive increments from the grooves.

3. The method of transferring solid particles from a heterogeneous supply thereof and depositing solid particles, from said supply thereof, on a material in a predetermined pattern and comprising the steps: bringing into contact with solid particles of said heterogeneous supply thereof a surface porous to air in a predetermined pattern but otherwise air-impervious, securing solid particles from said supply to a face of said surface by the effect of a partial vacuum applied at the other face of said surface, while maintaining such partial vacuum and retaining to a face of said surface the pattern of solid

particles, moving said surface from association with the supply of solid particles to depositing position, with the face to which the solid particles are retained lowermost, and while so positioned discontinuing the effect of the partial vacuum aforesaid and receiving the consequently released pattern of solid particles on a surface of a material in said predetermined pattern of solid particles.

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