Aug. 16, 1932. E. E. KLUPMEYER ET AL 1,871,707

MATERIAL HANDLING APPARATUS

Filed June 27, 1930 2 Sheets-Sheet 1

Fig. 1.

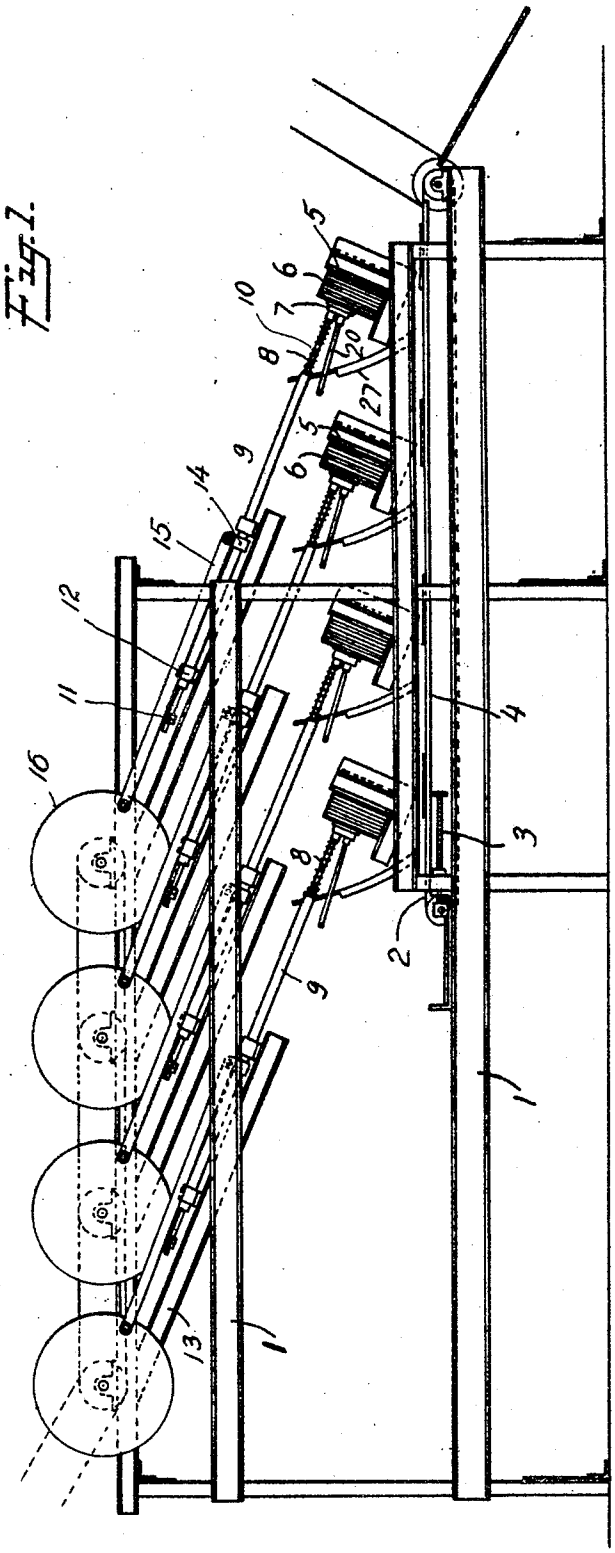
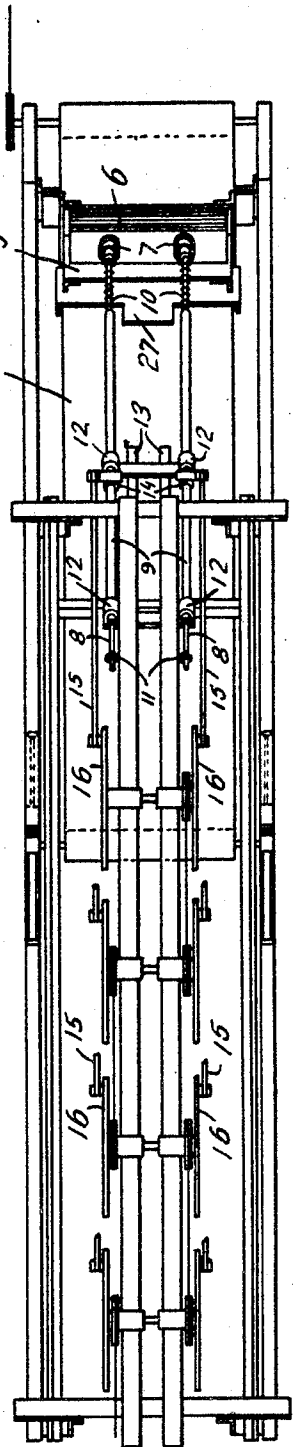


Fig. 2.



INVENTORS
Edward Ernst Klupmeyer
Aura Albert Maxwell
BY
ATTORNEY

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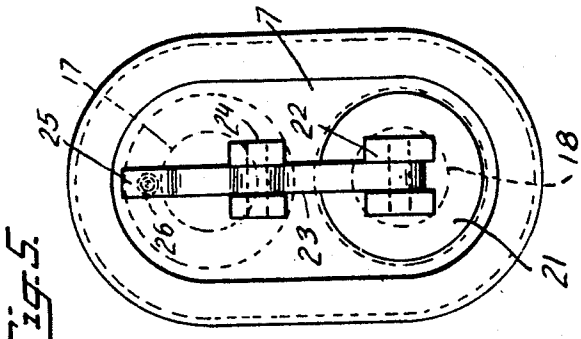



Fig. 5.

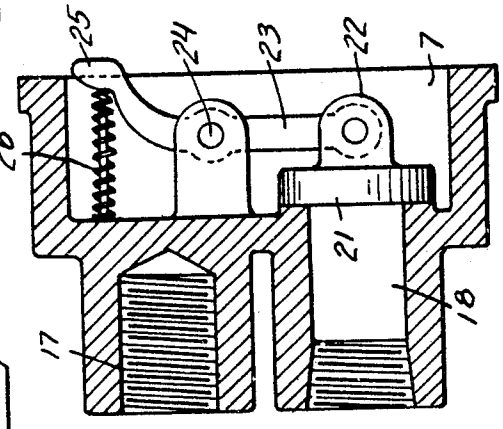



Fig. 4.




Fig. 3.

INVENTORS
Edward Ernst Klupmeyer
Aura Albert Maxwell
BY
Lester Dellenbaugh
ATTORNEY

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# UNITED STATES PATENT OFFICE

EDWARD ERNST KLUPMEYER AND AURA ALBERT MAXWELL, OF JOLIET, ILLINOIS, ASSIGNORS TO THE RUBEROID CO., OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY

## MATERIAL HANDLING APPARATUS

Application filed June 27, 1930. Serial No. 464,160.

This invention relates to material handling apparatus, and particularly to a device for handling flexible shingles, shingle-strips, and the like.

Among the objects of the invention are to provide a device comprising a conveyor, a plurality of holding means each holding a pile of articles, and means for lifting the articles one by one from each of the piles and depositing them upon the conveyor in a regular sequence.

Prepared roofing shingles and shingle strips are now made in different colors and color blends, and are packed in bundles each containing a predetermined color assortment. This invention provides means whereby the color assortment may be effected mechanically and the shingles or strips laid upon a conveyor in such arrangement that they may be formed into bundles directly as they are delivered from the conveyor.

Other advantages and objects of the invention will appear from the following description thereof, it being understood that modifications of the same may be made by one skilled in the art without departing from the principle of the invention and within the scope of the claims.

The accompanying drawings illustrate one embodiment of the invention, in which:—

Figure 1 is a side elevation of the apparatus;

Fig. 2 is a plan view with certain of the lifting units broken away;

Fig. 3 is a detail view of one of the lifting units including the suction cup and appurtenant parts;

Fig. 4 is an enlarged sectional view of the suction cup; and,

Fig. 5 is a front view of the same.

Referring to the drawings, 1 designates the frame on which is mounted a power driven conveyer 2, preferably of the endless type provided with conventional adjusting devices. 3. The upper reach of the conveyer belts travel over and are supported by slats or rails 4.

Mounted on the frame above the conveyer are a plurality of racks 5 each holding a pile 6 of shingles or strips. Each pile preferably consists of shingles or strips of one color, but the colors of the several piles respectively being usually different. The particular machine illustrated is intended to sort shingles or strips of four colors and is accordingly provided with four racks. Obviously more or less racks may be used.

Means are provided for lifting the shingles or strips one at a time from the piles and delivering them to the conveyer. The lifting means are arranged in units, one unit for each pile of shingles or strips to be handled, each unit consisting of one or more reciprocating lifters depending on the length of the shingles or strips. In the present instance the units each comprise two lifters arranged transversely of the machine.

The lifters are all precisely similar in construction and operation, and accordingly it is merely necessary to describe one in detail. Each lifter has a suction cup 7 attached to the foot of a rod 8, which rod extends freely through a tube 9. On the lower portion of rod 8, bearing between the lower end of tube 9 and the suction cup 7, is a compression spring 10, while on upper threaded end of said rod is a lock nut 11. The tube 9 is supported for reciprocating movement in sleeves 12 on the frame part 13. A collar 14, fixed to tube 9, is connected by a connecting rod 15 with a power driven wheel 16 mounted on the frame 1. Rotary motion of wheel 16 imparts a reciprocating motion to the tube 9. On the downward stroke of said tube its lower end bears against the spring 10 and presses the suction cup 7 against the topmost shingle or strip of pile 6, said spring compensating for variation in height of the pile as the shingles or strips are removed therefrom. On the reverse stroke the upper end of tube 9 bears against the lock nut 11 on rod 8 and lifts the suction cup, with the attached shingle or strip, away from the pile.

The suction cup 7, shown in detail in Figs. 4 and 5, has an internally threaded boss 17 by which it is attached to the foot of the lifter rod 8. The cup also has a suction port 18 threaded to receive the coupling 19 of a hose 20 leading to a suction or vacuum pump (not shown). A valve disc 21 seats on the inner

face of the suction port, normally closing said port. The valve disc has a lug 22 by which it is pivotally attached to a lever arm 23, which arm is supported on a fulcrum 24. The free end 25 of said arm extends forward slightly beyond the plane of the face of the cup. As the suction cup is brought into contact with a shingle or strip, the free end of the lever arm is depressed, against the spring 26, thereby opening the valve and applying suction to the cup.

To detach the shingle or strip from the cup, a stripper plate 27 is provided, which plate is mounted on the frame 1. On the upward stroke of the lifter the shingle is carried against said plate and stripped from the cup. The plate 27 also serves to guide and direct the shingle or strip onto the conveyer 2.

The several units of the machine operate simultaneously, each lifting a shingle or strip from a pile and depositing it on the conveyer. The shingles or strips are then delivered by the conveyer and discharged or removed in the order in which they have been laid thereon, and formed into packages in which the differently colored shingles or strips are arranged in a regular color sequence.

What we claim is:—

1. A material handling device comprising a conveyor, a series of material containing bins, a series of material handling devices, a suction chamber mounted on each of said devices, means actuated when said chamber is in contact with the material for rendering said suction chamber operable to lift material from one of said bins and means for operating said handling devices and suction chambers into contact with said material and then over said conveyor.

2. A material handling assembly comprising a conveyor, a series of material containing bins, a series of material handling devices, a suction chamber mounted on each of said devices, means carried by said chamber and actuated by contact with the material for rendering said suction chamber operable to lift material from one of said bins, and means for operating said handling devices and suction chamber into contact with said material and then over said conveyor.

3. A material handling assembly comprising a conveyor, a series of material containing bins, a series of material handling devices, a suction chamber mounted on each of said devices, means carried by said chamber and actuated by contact with the material for rendering said suction chamber operable to lift material from one of said bins, means for operating said handling devices and suction chamber into contact with said material and then over said conveyor, and means operable when said handling device is over said conveyor for releasing the material from said suction chamber.

4. A material handling assembly comprising a conveyor, a series of spaced material bins mounted above said conveyor, a plurality of material handling devices, means for reciprocating said devices into contact with material in said bins and then over said conveyor, a suction chamber mounted on the material contacting end of each of said handling devices, means carried by said chamber and actuated by contact with the material for rendering said suction chamber operable to lift material from one of said bins, and stripping means operable when said suction chamber is over said conveyor for releasing the material from said chamber.

5. A material handling assembly comprising a conveyor, a support for a pile of material, a material handling device, means for reciprocating said device into contact with material on said support and then over said conveyor, a suction chamber mounted on the material contacting end of said device, means urging said suction chamber forwardly into contact with the material to compensate for decrease in height of the pile as material is removed therefrom, means carried by said chamber and actuated by contact with the material for rendering said suction chamber operable to lift material from said support, and stripping means operable when said suction chamber is over said conveyor for releasing the material from said chamber.

Signed at Joliet in the county of Will and State of Illinois.

EDWARD ERNST KLUPMEYER.
AURA ALBERT MAXWELL.