Dec. 7, 1937. P. ARNDT 2,101,464

ADHESIVE APPLYING DEVICE

Filed Aug. 14, 1936

Fig. 1

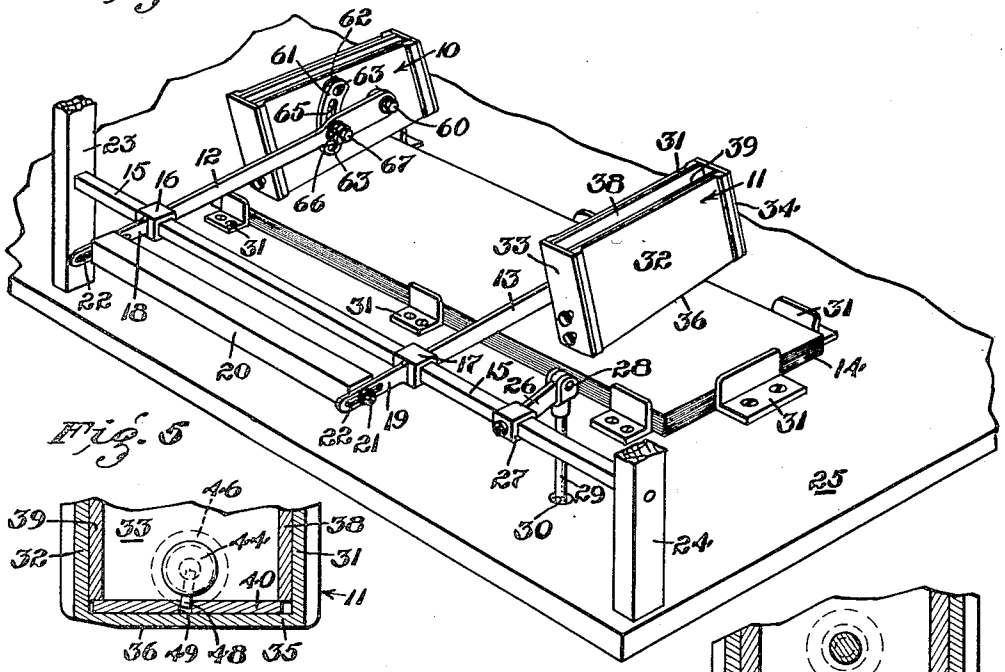


Fig. 5

Fig. 2

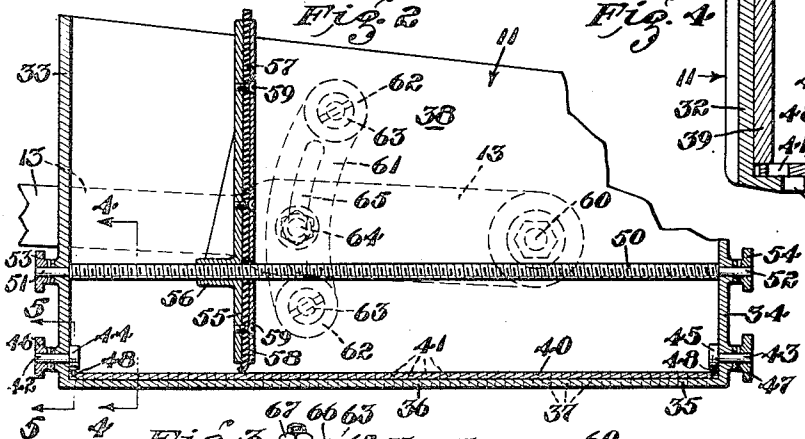


Fig. 4

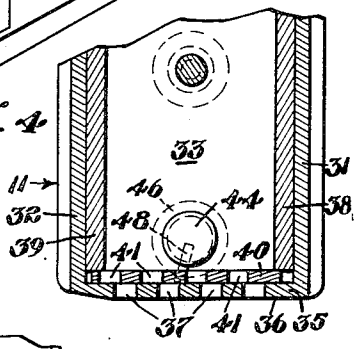
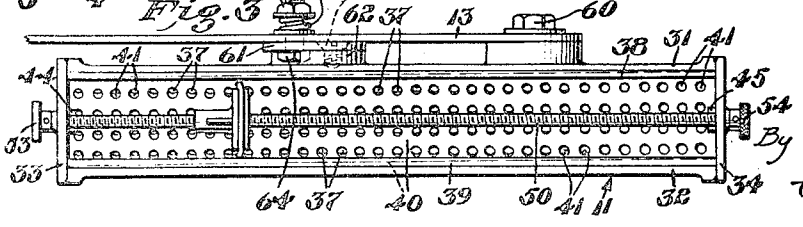


Fig. 3



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ADHESIVE APPLYING DEVICE

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14 Claims. (Cl. 91—47)

This invention relates generally to apparatus for applying fluent adhesive material to labels or the like and lifting the same from a label stack for application upon articles to be labeled. The invention relates more particularly to certain improvements in the adhesive applying devices used in connection with said apparatus.

In my pending application Serial Number 25,993, filed June 11, 1935, I show an apparatus for lifting one label at a time from a label stack to a position where it can be conveniently removed and applied to an article to be labeled. The apparatus embodies a pair of spaced containers which are mounted for swinging movement onto the marginal edges of the uppermost label of the label stack, and which contains a fluent adhesive. The adhesive applying surfaces of said containers are supplied with adhesive through a plurality of small openings communicating between said surfaces and the interiors of the containers. Thus the engagement of the adhesive applying surfaces with the marginal edges of the labels cause the adherence of said label thereto. Accordingly when the containers are swung away from the label stack it will be obvious how the uppermost label is lifted from the stack to a position where it may be removed and applied to an article.

Although the foregoing method of applying adhesive to and lifting the labels has proved quite satisfactory, certain disadvantages have attended the application of the adhesive material to the label edges. For instance, when the containers are swung to their uppermost position the level of the fluent adhesive therein assumes a horizontal position, and the fluid head is gradually increased from the forward to the rearward ends of the containers. Obviously, the quantity of adhesive material admitted to the adhesive applying surfaces varies from the forward to the rearward ends of said surfaces when the containers are angularly disposed. This uneven application of the adhesive material to the adhesive applying surfaces is undesirable, since it results in a non-uniform application of adhesive to the label edges.

It is an object of the invention to provide an adhesive applying device of the character referred to, with means associated therewith for ensuring the uniform application of the adhesive material onto the adhesive applying surface; and to further provide means for controlling the quantity of adhesive supplied to the adhesive applying surface.

Another object of the invention is the provision of an adhesive applying device which will uniformly apply a fluent adhesive to a surface, and which is positive and accurate in its actuation.

The uniform application of adhesive material to the adhesive applying surfaces of the containers might be accomplished by providing graduated openings in the bottoms of said containers. That is, by gradually decreasing the size of the openings from the forward ends of the containers to the rearward ends thereof. However such arrangement is impractical, since it is often desired to employ adhesive materials of different viscosities, and although one set of graduated openings might suffice to accommodate one adhesive material, they might be entirely unsatisfactory for accommodating adhesives of different viscosities.

It is accordingly another object of the invention to provide an adhesive applying device which will accommodate fluent adhesive materials of different viscosities and which is provided with means for ensuring their uniform application upon the adhesive applying member of said device.

A further object of the invention is the provision of a container for fluent adhesive material, and which has an exterior adhesive applying surface with openings leading therefrom to its interior, said container also having means associated therewith for rendering some of the openings non-communicative with the body of adhesive material within the container, whereby to prevent the flow of adhesive material onto the area of the adhesive applying surface embodying said openings.

A still further object of the invention is to provide a partition within the container, which forms a fluid tight seal with the inner surfaces thereof and which is adjustable for altering the confines of the adhesive material therein, whereby to limit the application of adhesive material onto that portion of the adhesive applying surface lying beneath the body of adhesive material.

A further object of the invention resides in means for mounting the container on its movable support, whereby to effect a uniform application of adhesive upon the surface engaged by the adsive applying surface of the container.

This invention possesses many other advantages and has other objects which will be made more easily apparent from a consideration of the embodiment thereof shown in the accompanying drawing and forming part of the present specification. I shall now proceed to describe this form in detail, which illustrates the general principles

of the invention; but it is to be understood that this description is not to be taken in a limiting sense, since the scope of the invention is best defined in the appended claims.

In the drawing:

Figure 1 is an isometric view of an apparatus for applying adhesive to and lifting labels, and which embodies my present invention.

Figure 2 is a longitudinal sectional view through one of the containers for adhesive illustrated in Figure 1.

Figure 3 is a top plan view of the container shown in Figure 2.

Figure 4 is an enlarged fragmentary sectional view taken as indicated by line 4—4 of Figure 2, and

Figure 5 is an enlarged fragmentary sectional view taken as indicated by line 5—5 of Figure 2.

Referring more in particular to Figure 1 of the drawing, I show a pair of spaced containers 10 and 11 for fluent adhesive material. The containers are supported on arms 12 and 13 respectively for swinging movement toward and away from a label stack 14, and are spaced for engagement with the marginal ends of the labels. The adhesive applying surfaces of the containers are supplied with adhesive material in a manner hereinafter fully described, and the engagement of said surfaces with the label ends serves to apply the adhesive material thereto. The labels are lifted from the stack by virtue of their adherence to the adhesive applying surfaces of the containers. The purpose of such a device is to apply adhesive to and lift one label at a time from a label stack, to a position where it can be conveniently removed and applied to an article to be labeled. Such a device is fully disclosed in my pending application hereinbefore identified. The present invention relates primarily to means for ensuring the uniform application of the adhesive to the adhesive applying surfaces of the containers, and also to means for ensuring the uniform application of adhesive to the label edges from said adhesive applying surfaces.

The supporting arms 12 and 13 for the containers are connected to a rocker bar 15 through the collars 16 and 17 formed on the rearward ends of the arms. Said arms are provided with rearwardly extending portions 18 and 19, which carry a counter-weight 20 for the purpose of counterbalancing the containers 10 and 11 together with their contents. The counter-weight is adjustably secured to the extended portions 18 and 19 of the arms by bolts 21, which extend through elongated slots 22 in said extended portions and are threaded into the opposite ends of the counter-weight. The rocker bar 15 is pivotally supported at opposite ends in supporting members 24 extending upwardly from the table 25.

The movement of the containers 10 and 11 toward the label stack might be effected as shown in my pending application, in which a series of operating connections are provided between the supporting frame for the containers and a track upon which the containers are moved into and out of label applying position (not shown in this case). Said operating connections are acted upon by the articles to be labeled as they move away from label applying position, for effecting the movement of the containers onto the label stack. However, numerous methods other than that just described might be provided for moving the containers onto the label stack. For purposes of explanation I have shown an operating arm 26 connected at one end to the rocker arm 15 through the collar 27 formed thereon. The opposite end of said arm is pivotally connected as at 28 to a rod 29 which passes through an opening 30 in the table 25. Said rod might form one of the operating connections shown in my pending application, or might form a part of any suitable arrangement for moving the containers onto the label stack. In the drawing the counterweight 20 serves to lift the containers away from the label stack, which is maintained in position by the guide members 31 secured to the table 25.

The construction of the containers for the fluent adhesive is identical and only one is shown in detail for purposes of explanation. It includes sides 31 and 32, ends 33 and 34, and a bottom 35 having an exterior adhesive applying surface 36. The bottom 35 is provided with longitudinal rows of spaced openings 37, through which the fluent adhesive material is adapted to ooze onto the adhesive applying surface 36 from the interior of the container. The adhesive material assumes the form of protuberances from the mouths of the container openings when the containers are out of engagement with the label stack. When the containers are moved onto the marginal edges of the uppermost label, the label adheres to the adhesive protuberances and is thereby lifted upon movement of the containers away from the label stack.

The uniform application of adhesive material to the label edges is desirable in order to facilitate the application of the labels upon the containers to be labeled. Accordingly, it is important that the adhesive material be uniformly supplied to the adhesive applying surfaces of the containers. Obviously, when the containers are moved away from the label stack to their upward label-removing position shown in Figure 1, the level of the fluent adhesive in said containers assumes a horizontal position. Accordingly, the fluid head is gradually increased from the forward to the rearward ends of the containers, which results in a graduated fluid pressure on the openings in the bottoms of such containers. In providing a plurality of capillary openings of uniform size in the bottoms of the containers such as is shown in my pending application hereinbefore identified, it will be obvious that the flow of adhesive material through said openings will be greatest toward the rearward ends of the containers when said containers are in their raised position, due to the increased fluid pressure at the rearward ends of the containers. Thus a greater quantity of adhesive is supplied to the rearward ends of the adhesive applying surfaces than to the forward ends thereof, and when said surfaces are moved into engagement with the uppermost label of the label stack, an excess of adhesive material is applied to those portions of the label engaged by the rearward ends of the adhesive applying surfaces. Furthermore, the excessive adhesive material has a tendency to flow down the rearward edges of the labels of the label stack, causing the adherence of the labels, which is undesirable.

The foregoing disadvantages are obviated in the present invention by the provision of control means within the containers for ensuring the uniform application of fluent adhesive to the adhesive applying surfaces of the containers. Said means is shown in connection with the container hereinbefore described in detail, and includes a

valve plate 40 which is supported on the container bottom 35 for transverse sliding movement. A series of openings 41 are provided in the valve plate 40 and said openings are similar in size and spacing to the openings 37 in the container bottom 35. The valve plate 40 is retained in sliding relation with the container bottom by liner plates 38 and 39, which are respectively mounted on the inner faces of the container sides 31 and 32 as by spot welding. The lower edges of the liner plates 38 and 39 terminate sufficiently above the container bottom 35, to permit the movement of the valve plate 40, said plate being sufficiently narrower than the space between the container sides 31 and 32 to permit the movement of the plate openings 41 completely into and out of registration with the corresponding series of openings 37 in the container bottom 35. Furthermore, by positioning the valve plate angularly, it will be obvious how the rows of openings therein may be positioned angularly over the corresponding rows of openings in the container bottom so as to graduate the effective areas of the rows of container openings. The degree of graduation of the rows of container openings is determined by the angular position of the rows of valve plate openings thereover.

Independent means at opposite ends of the container 11 are provided for adjusting the plate 40 sidewise with respect to the container bottom 35. Said means includes pins 42 and 43 which extend through the container ends 33 and 34 respectively. They carry discs 44 and 45 on their inner ends and knurled adjusting knobs 46 and 47 on their outer ends. The discs 44 and 45 carry pins 48, which extend onto openings 49 in the opposite ends of the adjustable plate 40 and serve to move the plate sidewise upon manipulation of the adjusting knobs, all of which is shown clearest in Figures 2, 4, and 5 of the drawing. Obviously, either, or both ends of the plate 40 may be independently moved sidewise by turning the knurled adjusting knobs.

It will further be obvious how all of the openings 41 in the bottom of the container may be uniformly restricted, or the rows of openings progressively restricted from one end of the container to the other, through the manipulation of one or the other, or both, of the adjusting knobs. In Figure 3 the openings 41 in the forward end of the adjustable plate 40 are shown in complete registration with the openings 37 in the bottom of the container 11. The rearward end of said adjusting plate is shown moved to one side so that the rows of openings 37 in the container bottom are gradually restricted from the forward end of the container to the rearward end thereof. Thus when the container is filled with adhesive material and raised to the angular position shown in Figure 1, it will be obvious how the graduated outlet openings effect a substantially uniform supply of the adhesive material to the adhesive applying surfaces 36 of the container, since the outlet openings are gradually restricted, corresponding to the variation in the fluid head within the container. Although the adjustment shown in Figure 3 might be suitable for accommodating an adhesive material of a certain viscosity, it might be altogether unsatisfactory for a fluid having a different viscosity. However, through the angular adjustability of the plate it will be obvious how adhesive materials of different viscosities may be readily accommodated by the adhesive applying device.

In order to accommodate labels of different widths, an adjustable partition is provided within the paste container for making possible the application of adhesive to different sections of the adhesive applying surface of the container. The partition includes a plate 55 having a boss 56 which is threaded onto a threaded adjusting rod 50. A yieldable member 57 formed of rubber or the like is clamped between the plate 55 and a second plate 58 by screws 59, as shown clearest in Figure 2. A slight space is provided between the side edges of the clamping plates 55 and 58 and the liners 38 and 39 within the container. A slight space is also provided between the lower edges of the clamping members and the valve plate 40. The resilient member extends beyond the outer edges of the clamping plates and forms a fluid tight seal with the liners and also with the valve plate. The engagement of the yieldable member 57 with the valve plate 40 facilitates in holding said plate in its adjusted position. The ends of the threaded adjusting rod 50 are reduced as at 51 and 52. The reduced portions extend through the end walls 33 and 34 of the container and carry knurled adjusting knobs 53 and 54 on their outer ends. Thus the partition may be readily moved longitudinally of the container on the adjusting rod by turning either of the knobs. The adhesive material is adapted to be contained between the partition and the forward end 34 of the container. Obviously, the application of adhesive to the adhesive applying surface 36 is confined to that section of said surface which underlies the body of adhesive, since any outlet openings behind said partition are rendered noncommunicative with the body of adhesive. Thus, through the adjustment of the partition with respect to the end wall 34, the application of adhesive may be confined to different sections of the adhesive applying surface 36, thereby making possible the accommodation of labels of different widths.

In order to insure a uniform bearing relation between the adhesive applying surfaces of the paste containers and the labels, it is preferable to yieldably mount the containers on their respective supporting members for angular movement with respect thereto. This is accomplished by pivotally connecting the outer ends of the supporting arms 12 and 13 to the inner sides of the respective paste containers 10 and 11 through bolts 60, which extend through the supporting arms and are threaded into bosses formed on the inner sides of the containers. Plates 61 are disposed rearwardly of said pivotal connections and are mounted in spaced relation to the inner sides of the paste containers on bosses 62 formed on the container sides. The plates are secured to said bosses as by screws 63. Bolts 64 extend through the supporting arms 12 and 13, and through the arcuate slots 65 formed in the plates 61, the heads of said bolts being disposed between the plates and the container sides as shown clearest in Figure 3. The supporting arms are held in frictional engagement with the plates 61 through coil springs 66, which are positioned between the supporting arms and nut 67 threaded onto the bolts 64. Suitable frictional engagement may be maintained between the supporting arms 12 and 13 and the container plates 61, through the adjustment of the nuts 67, to maintain the paste containers in their adjusted position and normally restrain them against movement about their pivotal supports. However, if for any reason one end of either container engages the label stack in advance of its other end, it will be obvious how the

container is free to yield until its entire adhesive applying surface moves into bearing relation with the uppermost label of the stack, thus insuring the uniform application of adhesive material to the label.

It should be understood that the adhesive applying surfaces of the paste containers include both the open and solid areas, and that the adhesive material oozes through the capillary openings 37 when said containers are in their angular position, and protrudes from the mouths of said openings as heretofore described. When the containers are moved onto the label stack, the uppermost label adheres to the protuberances of adhesive material and is lifted from the stack when the containers are moved therefrom. It will be obvious from the foregoing description how applicant is able to maintain a substantially uniform application of adhesive to the adhesive applying surfaces of the container by the use of his valve plate. It will further be obvious how this may be accomplished when adhesive materials of different viscosities are contained in the paste receptacles, through the simple adjustment of the valve plate.

Although the invention is shown and described in connection with an apparatus for lifting labels and applying adhesive material thereto, it should be understood that said invention might be equally useful in applying adhesive material to any surface.

I claim:

1. In a device for applying a fluent adhesive to a surface, a container for the adhesive, an adhesive applying member carried by the container, means for swinging the container angularly toward a surface upon which the adhesive is to be applied, means forming a series of apertures through which adhesive is supplied from the container to the applying member, and means for ensuring that the adhesive will be uniformly supplied to the applying member from the container through the series of apertures.

2. In a device for applying a fluent adhesive to a surface, a container for the adhesive, an adhesive applying member carried by the container, means for swinging the container angularly toward a surface upon which the adhesive is to be applied, means forming a series of apertures through which adhesive is supplied from the container to the applying member, and means for ensuring that the adhesive will be uniformly supplied to the applying member from the container through the series of apertures, comprising means cooperative with the apertures for so adjusting the effective areas of the series of apertures that these areas are of non-uniform size.

3. In a device for applying a fluent adhesive to a surface, a container for the adhesive, an adhesive applying member carried by the container, means for swinging the container angularly toward a surface upon which the adhesive is to be applied, means forming a series of apertures through which adhesive is supplied from the container to the applying member, means for ensuring that the adhesive will be uniformly supplied to the applying member from the container through the series of apertures, comprising a valve plate having a series of apertures cooperating with the first series of apertures, and means for so adjusting said plate that the effective areas of the first series of apertures are of non-uniform size.

4. In a device for applying a fluent adhesive to a surface, a container for the adhesive, an adhesive applying member carried by the container, means for swinging the container angularly toward a surface upon which the adhesive is to be applied, means forming a series of apertures through which adhesive is supplied from the container to the applying member, means for ensuring that the adhesive will be uniformly supplied to the applying member from the container through the series of apertures, and means for rendering some of said apertures non-communicative with the adhesive in the container, whereby to prevent the application of adhesive to a portion of the adhesive applying member.

5. In a device for applying a fluent adhesive to a surface, a container for the adhesive, an adhesive applying member carried by the container, means for swinging the container angularly toward a surface upon which the adhesive is to be applied, means forming a series of apertures through which adhesive is supplied from the container to the applying member, means for ensuring that the adhesive will be uniformly supplied to the applying member from the container through the series of apertures, and means for ensuring the uniform application of adhesive from the adhesive applying member to the adhesive receiving surface.

6. In a device for applying a fluent adhesive to a surface, a container for the adhesive, said container having an exterior adhesive applying surface, means for swinging the container angularly toward a surface upon which the adhesive is to be applied, means forming a series of apertures through which adhesive is supplied to the adhesive applying surface from the container, a valve plate having a series of apertures cooperating with the first series of apertures, and means for adjusting said valve plate for varying the effective areas of the first series of apertures.

7. In a device for applying a fluent adhesive to a surface, a movably supported container for the adhesive material, said container having an exterior adhesive applying surface and a series of outlets through which adhesive is supplied to said adhesive applying surface from the container, common valve means for varying the relative effective areas of the series of outlets in the container, and means for rendering some of the outlets non-communicative with the body of adhesive in the container.

8. In a device for applying a fluent adhesive to a surface, a container for the adhesive, said container having an exterior adhesive applying surface, means for swinging the container angularly toward a surface upon which the adhesive is to be applied, means forming a series of apertures in one side of the container through which adhesive is supplied to the adhesive applying surface from the interior of the container, a valve plate disposed within the container and having a series of apertures which cooperate with the apertures in the container, means for adjusting said valve plate for varying the effective areas of the container apertures, and means for varying the confines for the adhesive within the container, whereby to prevent the application of adhesive to a portion of the adhesive applying surface of the container.

9. In a device for applying a fluent adhesive to a surface, a movably supported container for the adhesive material, said container having an exterior adhesive applying surface and a series

of outlets through which adhesive is supplied to said adhesive applying surface from the container, and common valve means for varying the relative effective areas of the series of outlets in said container.

10. In an adhesive applying and label lifting device, means for supporting labels in stacked form, an adhesive container adapted to be positioned angularly above said label stack and moved thereonto, said container having an adhesive applying surface and a series of apertures leading thereto from its interior, a valve plate having apertures corresponding to the container apertures and positioned adjacent thereto for relative movement, and means for so positioning the plate apertures with respect to the container apertures as to establish a series of graduated outlets which increase in size from the lower end to the higher end of said container when it is in its angular position, whereby to effect a substantially uniform application of adhesive to the adhesive applying surface and to the labels engaged and lifted thereby.

11. A container having a series of apertures in one of its sides, a valve plate supported for sliding movement adjacent said container side and having a series of apertures therein corresponding to the series in said container side, and means for positioning said valve plate at an angle with respect to the container side, whereby to render the effective areas of the series of apertures in the container of non-uniform size.

12. A container having a series of apertures in one of its sides, a valve plate supported for sliding movement adjacent said container side and having a series of apertures therein corresponding to the apertures in said container side, and means for adjusting either or both ends of said valve plate with respect to the container side.

13. A container having a plurality of apertures in one of its sides, a valve plate supported adjacent said container side for sliding movement with respect thereto, said valve plate having apertures therein corresponding to the apertures in the container, means for adjusting said plate for varying the relative effective areas of the container apertures, a partition within said container, means forming a fluid tight seal between said partition and the container sides, and means for adjusting said partition.

14. A container having spaced rows of apertures in one of its sides, a valve plate supported adjacent said container side for sliding movement with respect thereto, said valve plate having spaced rows of apertures corresponding to the rows of apertures in said container, and means for positioning the rows of plate apertures at an angle over the corresponding rows of container apertures, whereby to establish rows of graduated outlets from the interior of said container.

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