W. COSTELLO, JR.

NOZZLE FOR CAKE COATING MACHINES.

APPLICATION FILED SEPT. 27, 1919.

**1,384,601.**

**Patented July 12, 1921.**

2 SHEETS—SHEET 1.

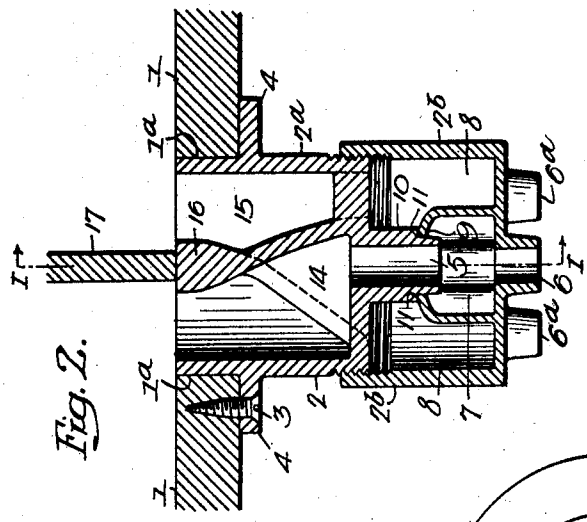


Fig. 2.

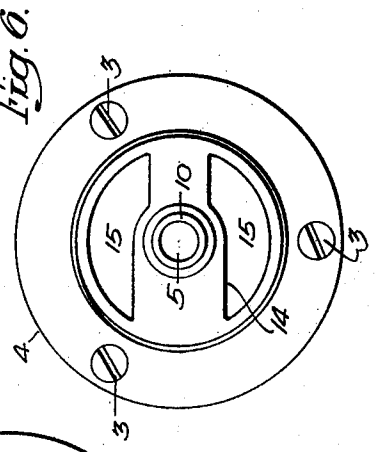


Fig. 6.

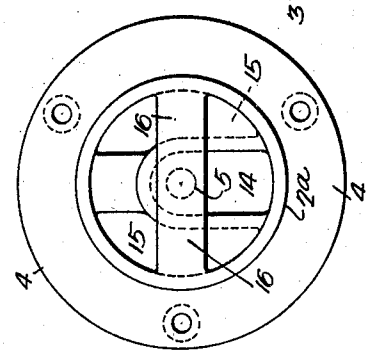


Fig. 5.

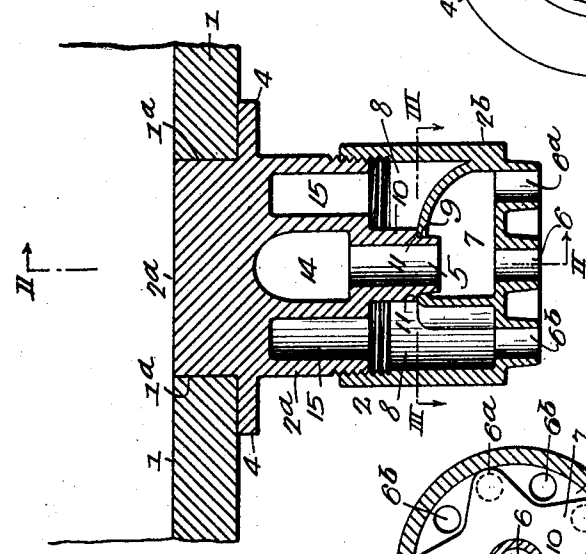


Fig. 1.

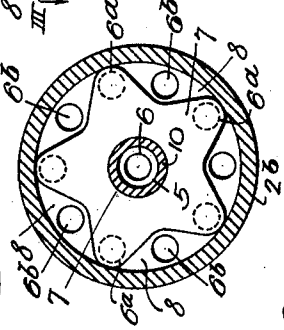


Fig. 4.

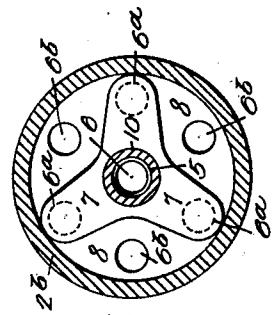


Fig. 3.

Inventor—
William Costello, Jr.
by his Attorneys—
Howson & Howson

W. COSTELLO, JR.

NOZZLE FOR CAKE COATING MACHINES.

APPLICATION FILED SEPT. 27, 1919.

1,384,601.

Patented July 12, 1921.

2 SHEETS—SHEET 2.

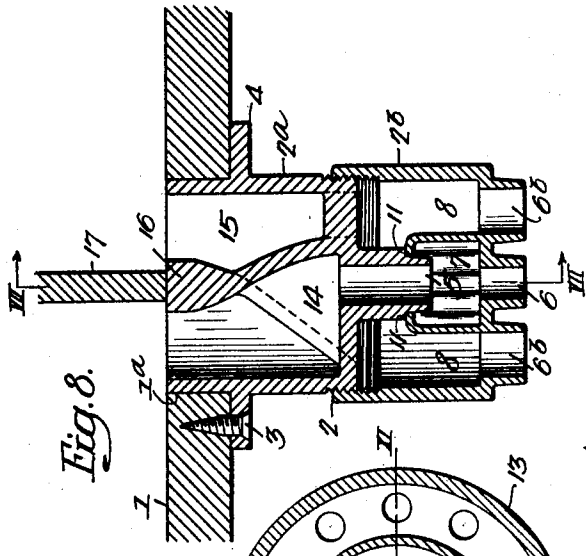


Fig. 8.

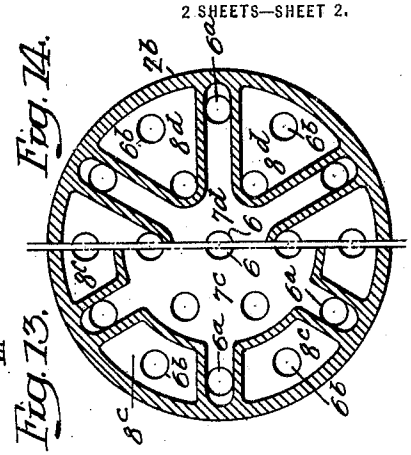


Fig. 13.



Fig. 14.

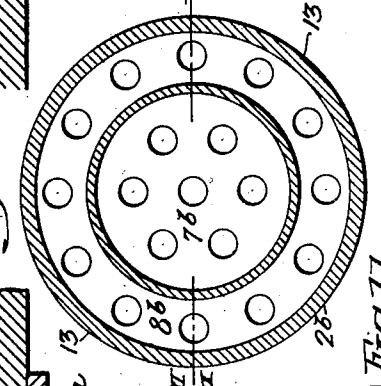


Fig. 12.

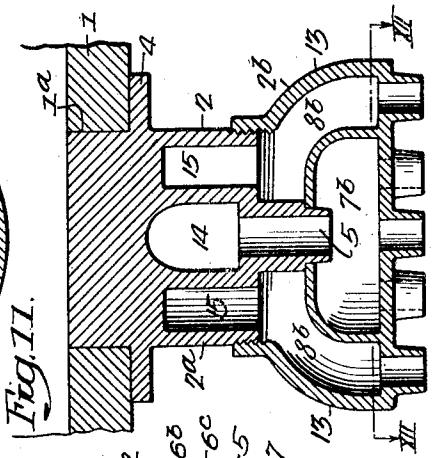


Fig. 11.

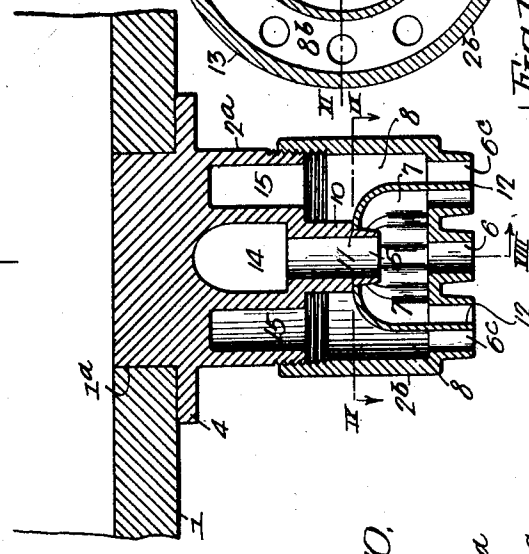


Fig. 7.

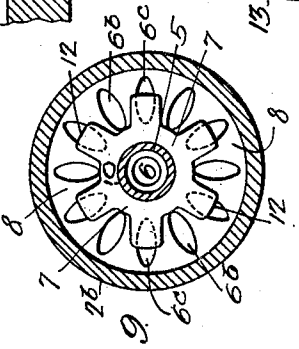


Fig. 9.

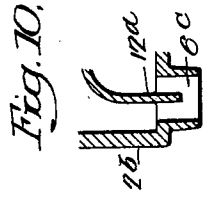


Fig. 10.

Inventor—
William Costello, Jr.
by his Attorneys—
Howson & Howson

# UNITED STATES PATENT OFFICE.

WILLIAM COSTELLO, JR., OF PHILADELPHIA, PENNSYLVANIA.

## NOZZLE FOR CAKE-COATING MACHINES.

1,384,601. Specification of Letters Patent. Patented July 12, 1921.

Application filed September 27, 1919. Serial No. 326,779.

*To all whom it may concern:*

Be it known that I, WILLIAM COSTELLO, Jr., a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Nozzles for Cake-Coating Machines, of which the following is a specification.

My invention relates to cake coating machinery; and the object of my invention is to provide an improved form of nozzle from which coating or icing for cakes in the form of marsh-mallow, sugar icing, jelly, and material of a like nature may be discharged from a plurality of apertures.

A further object of my invention is to provide a nozzle capable of discharging through a plurality of apertures coating material of two different kinds from independent reservoirs communicating with the discharge apertures.

A further object of my invention is to provide means whereby the deposits of coating material from one source may be interspersed with the deposits of coating material from another source; either one of such sources providing the portion of the deposit centrally disposed; and a still further object of my present invention is to provide means whereby coating material from two sources may be discharged through what may be called, substantially at least, a single aperture of the nozzle.

These and other features of my invention are more fully described hereinafter, reference being had to the accompanying drawings, in which:

Figure 1, is a sectional elevation of one form of nozzle within the scope of my invention; the same being taken on the line I—I, Fig. 2, and showing an annular row of apertures in which the alternate ones are in communication with the same kind of coating material.

Fig. 2, is a sectional elevation on the line II—II, Fig. 1.

Fig. 3, is a sectional plan view on the line III—III, Fig. 1.

Fig. 4, is a view similar to Fig. 3, illustrating a detail within the scope of my invention.

Fig. 5, is a plan view of the nozzle shown in Figs. 1, 2 and 3.

Fig. 6, is an inverted plan view of the upper portion of said nozzle.

Fig. 7, is a view similar to Fig. 1, showing a form of nozzle in which provision is made for discharging a plurality of materials through certain of the outlets.

Fig. 8, is a view similar to Fig. 2, of the structure shown in Fig. 7.

Fig. 9, is a sectional plan view on the line IX—IX, Fig. 7.

Fig. 10, is a view illustrating a modification of the structure shown in Fig. 7.

Fig. 11, is a vertical section taken on the line XI—XI, Fig. 12, and illustrates a further modification within the scope of my invention.

Fig. 12, is a horizontal section of the modification of Fig. 11, taken on the line XII—XII of that figure, and

Figs. 13 and 14, are partial horizontal sections of still further modifications, and are similar to the complete section of Fig. 12.

The nozzle to which my present improvements have been applied is of the same general type as those illustrated in my Patent No. 1,310,062, dated July 15, 1919, in which such nozzles are shown as two-part structures; one part being carried by the bottom of the coating hopper and provided with a partition for alinement with the hopper partition so that the material from a pair of hoppers may be separately distributed to certain of the outlets of the nozzle structure, while the other part (having the outlet apertures) is detachably connected to the part carried by the bottom of the coating hopper.

I have shown in the present drawings, a bottom plate 1 arranged to receive nozzles 2 of the double compartment type (one of which is shown); said nozzle comprising a portion $2^a$ let into an aperture $1^a$ in the bottom plate 1 and held in place by screws 3 engaging a flange 4 thereof. Said portion $2^a$ has a discharge aperture or orifice 5, preferably centrally disposed, and a removable portion $2^b$, preferably in threaded engagement therewith, as clearly indicated in the drawings.

The removable portion $2^b$ is provided with a plurality of apertures, 6, $6^a$ and $6^b$, for the discharge of material from the several hoppers of the coating material; the aperture 6 being centrally disposed, and the apertures $6^a$ and $6^b$ surrounding the aperture 6 in an annular row and alternating with each other. In the present instance, the discharge aperture or orifice 5, instead of extending to the bottom wall of the removable portion $2^b$, delivers to an internal chamber

7 formed within said removable portion, and from this chamber lead the outlets 6 and $6^a$; the latter being interspersed between the outlets $6^b$ from which material within the main chamber 8 of the removable portion $2^b$ is discharged.

In the form of structure shown in Figs. 1, 2, *et seq.*, the wall of the chamber 7 carried by the removable portion has a central aperture 9 for the reception of the stem 10 of the portion $2^a$ having the discharge aperture or orifice 5; said stem being shouldered at 11 and seating in the wall forming the supplemental chamber 7 so as to insure a tight joint, which may be insured by screwing the part $2^b$ tightly into place.

In the form of nozzle shown in Figs. 1, 2, *et seq.*, the nozzle has seven outlets; a central outlet 6, and six outlets in an annular row surrounding the central outlet and indicated at $6^a$ and $6^b$. Three of these outlets, those marked $6^b$, communicate with the main chamber 8 of the removable member, while the other three, those marked $6^a$, are inclosed by and receive coating material from the supplemental chamber 7, which also supplies the aperture 6.

It will be understood, of course, that other forms of nozzles having a greater or less number of orifices or discharge apertures may be employed, and in Fig. 4, I have shown a form of nozzle wherein the removable section is provided with eleven apertures or outlets; a central aperture 6 surrounded by ten apertures in an annular row; one form of material being discharged through five of the apertures of the annular row, while another form of material is discharged through the five other apertures of the annular row and the central aperture.

A further feature within the scope of my invention is to arrange the discharge outlets or apertures of the removable portions $2^b$ of the nozzles so that both kinds of material delivered by said nozzles may be discharged through some of the duplex apertures or outlets. To this end, the structure may be as illustrated in Figs. 7, 8 and 9, wherein certain of the annular row of apertures or outlets, indicated at $6^c$, are shown as receiving material from each chamber of the removable part of the nozzle.

In Fig. 10, I have shown a modified form of duplex outlet which may be employed with the form of nozzle illustrated in Figs. 7, 8 and 9. In the structure as illustrated in these views, the duplex discharge outlets or apertures $6^c$ through which the two differing coatings pass has a partition 12, usually centrally disposed, that extends to the bottom plane of the wall making up such outlet, and material discharged from the same is delivered in substantially well defined patches on the cake directly adjacent each other; the line of cleavage between them being quite clear usually, though somewhat dependent upon the consistency of the coating material. In some instances, however, it may be desirable to allow the coating material from these independent sources to merge to a certain extent, and in Fig. 10, I have shown a form of outlet in which the partition, indicated at $12^a$, stops short of the bottom plane of the outlet.

The forms of nozzles shown in Figs. 1 to 8, both inclusive, are relatively small and are designed for operation upon relatively small cakes. It will be understood, of course, that nozzles may be provided with several rows of apertures for operation upon large or relatively large cakes, and in Figs. 11, 12, 13 and 14, I have shown a form of nozzle more particularly designed for the larger cakes, cookies and the like; Fig. 11, being a sectional elevation on the line XI—XI, Fig. 12; Fig. 12, being a sectional plan view on the line XII—XII, Fig. 11, and Figs. 13 and 14, illustrating modifications of the chambered portion of the part $2^b$ of the nozzle, and showing different arrangements of the outlets for the deposit of the several coating materials, in what may be considered special designs, on the cakes.

Fig. 11, shows a nozzle with its removable portion $2^b$ provided with a bulge or enlarged part 13, having an extra row of apertures; that is to say, the structure as illustrated in Figs. 11, 12, 13 and 14, is provided with nineteen outlets, each of which may be of the same size or of any convenient size and capable of any desired arrangement with respect to the material to be deposited. Thus in Figs. 11 and 12, the interior of the part $2^b$ is divided into two chambers, $7^b$ and $8^b$, one of which receives the coating material from the discharge aperture or orifice 5 of the portion $2^a$ of the nozzle structure, from which it may be delivered to the cakes through the seven central discharge outlets or apertures, while the outer chamber $8^b$ is provided with twelve outlets through which the coating material can be delivered adjacent the outer edge of a cake, cookie, or the like.

In the structure shown in Fig. 13; such figure illustrating half of a portion $2^b$ of a nozzle on the same section or plane as Fig. 12, the internal chambers $7^c$ and $8^c$ of said portion $2^b$ are so arranged that one material will be discharged from said chamber $7^c$ through the seven central apertures and the alternate apertures of the outer row; the other material going through the other apertures of said outer row.

Fig. 14, which view is on the same plane as Figs. 12 and 13, shows another modification in which the material from the central chamber $7^d$ is discharged through the central aperture and through the alternate apertures of the outer row; the other apertures of the

outer row and all of the apertures of the inner row receiving material from the other chamber, indicated at $8^d$.

As may be readily understood, the nozzles can be constructed with discharge outlets of any character whatsoever, and the interior of the portion $2^b$ can be divided into a pair of chambers in many different ways so that the coating material can be deposited in many different designs on the surface of the cakes or cookies when the several coating materials differ in color.

The portion $2^a$ of each nozzle has a pair of channels or passages 14 and 15; one channel communicating with the centrally disposed discharge outlet 5 for delivery to the supplemental chamber 7 of the removable portion $2^b$, while the other channel communicates with the main chamber 8 of said removable portion. Between the channels or passages 14 and 15, of the portion $2^a$ of the nozzle, a central wall or partition 16 is provided, which must be placed in its socket or aperture $1^a$ in the bottom plate 1, in line with the longitudinal axis of the same, and in such position underlying the central partition or division plate 17 of the coating material receptacle.

It will be understood that the sections $2^b$ of the nozzles may be universally interchangeable so that when the coating receptacle bottom 1 is equipped with the portions $2^a$ of the nozzles, any of the portions $2^b$ may be employed therewith; it merely being necessary to provide threaded engaging portions of the same size.

As in the patented structure referred to, the mechanism for forcing the material through the orifices or apertures may be arranged to effect delivery from both orifices or sets of orifices simultaneously, or from either orifice or set of orifices ahead of the other, depending entirely upon the effect which it is desired the coating material shall produce.

I claim:

1. In a nozzle, the combination with a relatively fixed portion having a plurality of channels or compartments of a distributing head detachably secured to said fixed portion and having a concentrically disposed substantially bell shaped inner partitioning wall forming an independent chamber in said head and having an opening centrally disposed in the top thereof, a duct leading from one of the compartments of the fixed portion to said central opening, another of the compartments of the fixed portion communicating with the other chamber of the distributing head, and discharge apertures in the distributing head leading from each of the chambers therein.

2. In a nozzle, the combination with a relatively fixed portion having two channels or compartments, of a distributing head detachably secured thereto and having a concentrically disposed substantially bell shaped inner partitioning wall forming an independent chamber therein, a duct leading from one of the compartments of the fixed portion to said independent chamber, said relatively fixed portion having apertures in the base establishing communication between said other compartment of the fixed portion and the other chamber of the distributing head, and apertures in the distributing head leading from each of the chambers therein.

3. In a nozzle, the combination with a relatively fixed portion having two channels or compartments formed therein, of a distributing head detachably secured thereto and provided with an annular row of apertures or outlets, a concentrically disposed substantially bell shaped inner partitioning wall in said head forming an independent chamber communicating with alternate holes of said annular row, and a duct establishing communication between said independent chamber and one of the channels or compartments of the fixed portion, the other compartment of said fixed portion being in communication with the remaining apertures of said annular row.

4. In a nozzle, the combination with a relatively fixed portion having two channels or compartments formed therein, of a distributing head detachably secured thereto having an annular row of discharge apertures therein, a concentrically disposed substantially bell shaped inner partitioning wall forming an independent chamber in said distributing head in communication with alternate holes of said annular row, and a duct forming communication between said independent chamber and one of the compartments of the fixed portion, the other compartment of the fixed portion being in communication with all of the holes of said annular row.

WILLIAM COSTELLO, JR.