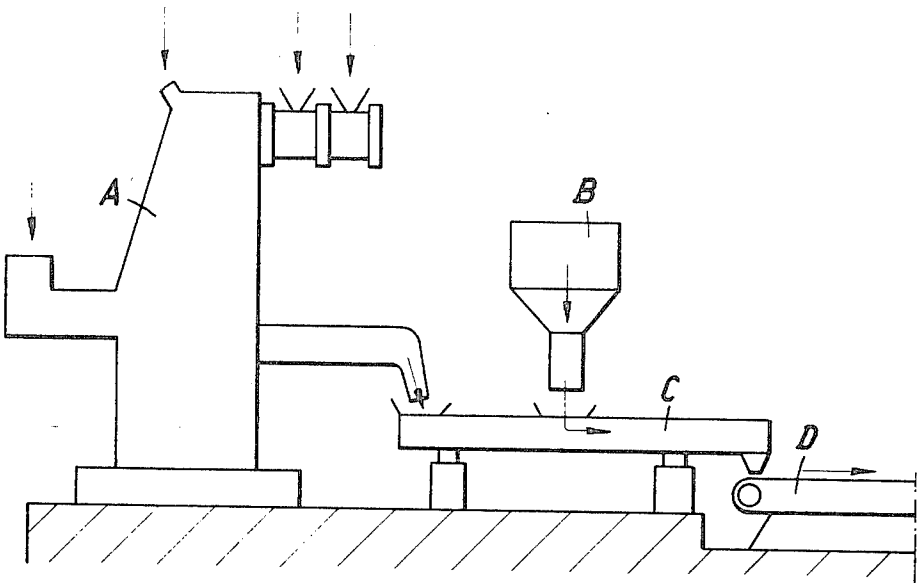


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[56] **References Cited**
UNITED STATES PATENTS
3,009,427 11/1961 Bell 107/4 F
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[54] **ARRANGEMENT FOR SELECTIVE PRODUCTION OF SWEETS, AS KROKANT- OR COULEUR- MASSES, SUGAR-NUT-BARS, SUGAR-COATED NUTS, ALMONDS, RAISINS, POP-CORN, OR THE LIKE**
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[50] Field of Search..... 107/4 F, 4, 54 F

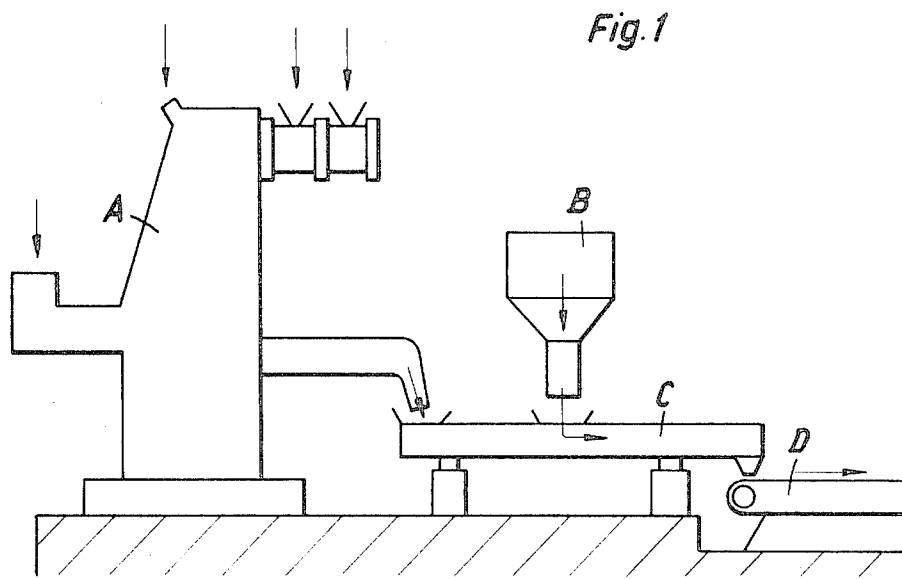
ABSTRACT: An arrangement for the selective production of sweets, as krokant or coloring masses, sugar-nut-bars, sugar-covered bars, almonds, popcorn, raisins or the like, which comprises a raw material working- and dosaging-set, a device for continuous melting of crystal- or other sugar masses, and a cooling- and delivery-device for the finished products. A krokant set, a coloring set, a bar set and a covering set for nuts, almonds, popcorn, raisins or the like are selectively operatively connected between the raw material working- and dosaging-set and the melting device, on the one hand, and the cooling- and delivery-device, on the other hand. Each of the intermediate sets comprises a treating chamber with transportation- and working-tools operating in the treating chamber, and the latter has feeding positions separated from each other for the masses to be worked.



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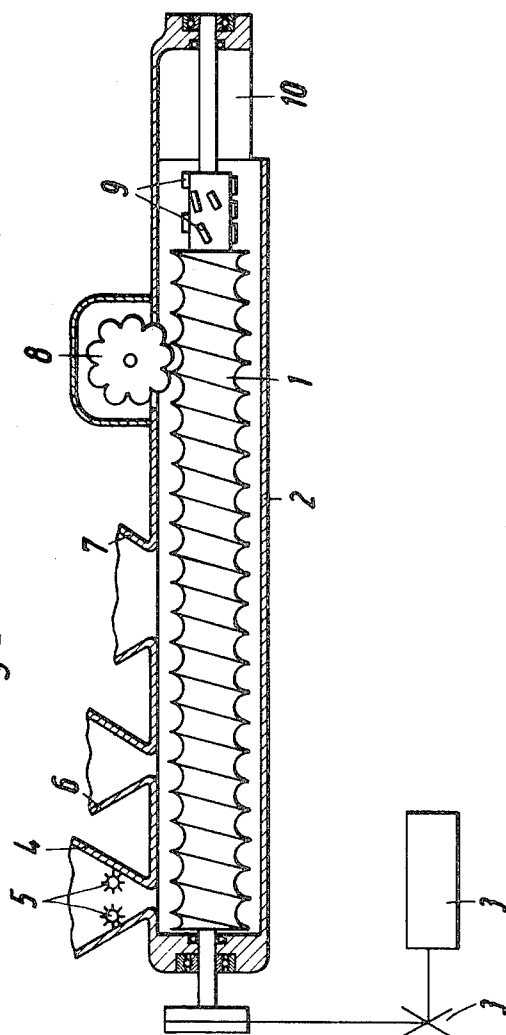
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SHEET 1 OF 5



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Fig. 2



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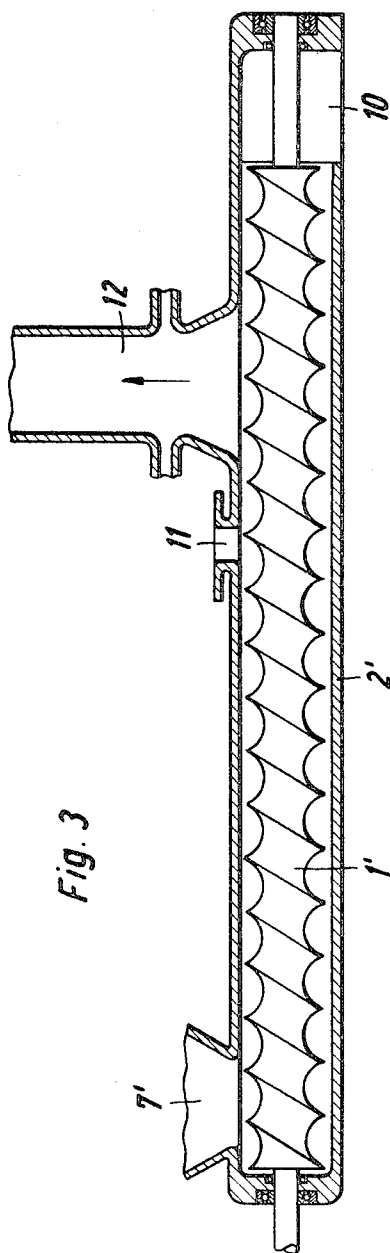


Fig. 3

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Fig. 4A

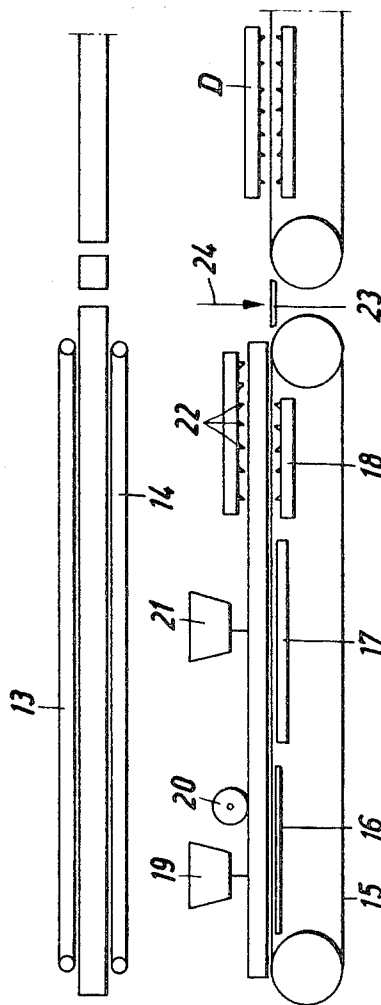
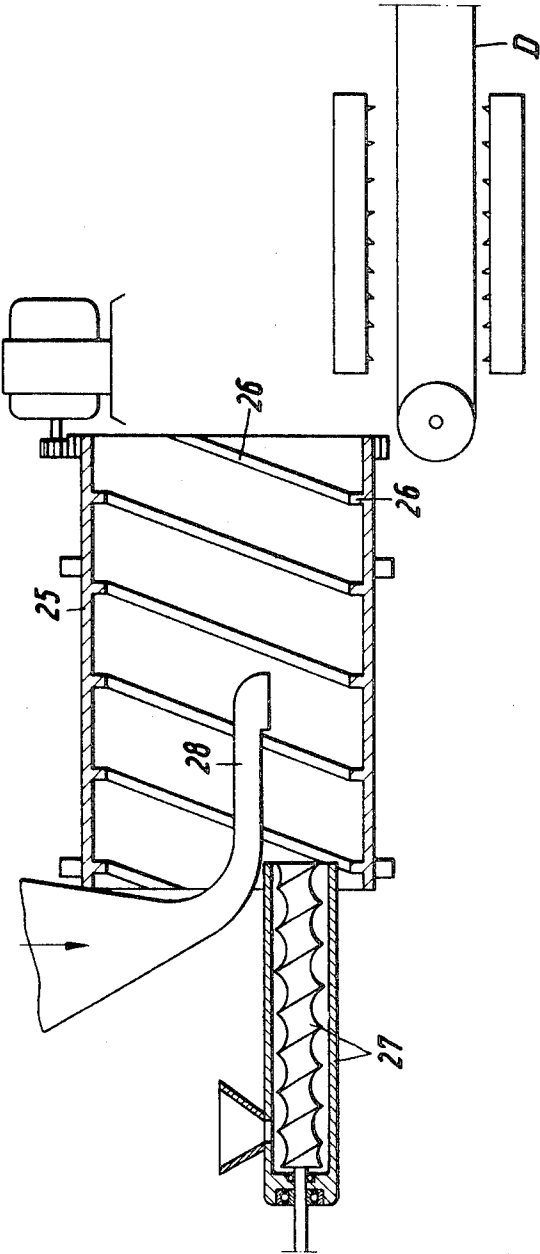


Fig. 4B

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Fig. 5



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ARRANGEMENT FOR SELECTIVE PRODUCTION OF SWEETS, AS KROKANT- OR COULEUR-MASSSES, SUGAR-NUT-BARS, SUGAR-COATED NUTS, ALMONDS, RAISINS, POP-CORN, OR THE LIKE

The present invention relates to an arrangement for the selective production of sweets, as for instance krokant or color masses, sugar-nut-bars, sugar-covered nuts, almonds, raisins, popcorn or the like.

For the production of such products, the most different starting materials are knowingly used, in the first place molten sugar masses. However, also other raw materials, as nuts, raisins, almonds, milk, fat, glucose, etc. are added as other starting materials.

A drawback of the known production arrangements resides in the fact, that they are suitable only for the production of a single product. They comprise, under circumstances, an apparatus for the raw material working and dosaging, as well as a device for the continuous melting or crystal- or other sugar masses and a cool- and a removal device for the finished products. A forming machine could be set at the end of this arrangement, so that the possibility exists to transform the arriving tempered mass in the outlet device into predetermined shapes.

It is one object of the present invention, to provide an arrangement for the selective production of sweets, (as krokant or color masses, sugar-nut-bars, sugar-covered nut, almonds, raisins, popcorn or the like) wherein the drawbacks of the known arrangements are removed.

It is another object of the present invention to provide an arrangement for the selective production of sweets, (as krokant or color masses, sugar-nut-bars, sugar-covered nut, almonds, raisins, popcorn, or the like) which permits selectively to produce in a most economical manner one or the other of the sweets. In accordance with the present invention, this is brought about such, that between the raw material working and dosing device and the melting device, on the one hand, and the cooling and removing apparatus on the other hand, selectively, a krokant set, a coloring set, a bar set or a covering set for nuts, almonds, popcorn, raisins or the like can be shifted in, whereby these sets to be shifted in between comprise a treating chamber having conveyance- and working tools operating therein and the treating chamber has preferably inlet positions separated from each other for the masses arriving for the working.

The sets, to be selectively shifted in the arrangement, are adjusted as to their structure to the different production and the characteristic of the product to be produced, respectively. By sensing devices provided in the treating chamber and at the corresponding conveying members and working tools, respectively, a continuous control and automatic regulation of the total working steps can be obtained, in particular the temperature and the humidity can be observed exactly and permit the dosing of the individual ingredients of the masses to be worked as to quantities, so that a fully automatic production and working, respectively, is made possible without requiring additional serving labor.

With these and other objects in view which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings, in which:

FIG. 1 is a schematic elevation of the total apparatus of the arrangement;

FIG. 2 is a schematic axial section of the krokant set;

FIG. 3 is a schematic axial section of the coloring set;

FIG. 4A is a schematic top plan view of the bar set;

FIG. 4B is a schematic elevation of the bar set; and

FIG. 5 is a schematic axial section of the covering set.

Referring now to the drawings, and in particular to FIG. 1, the total arrangement comprises a raw material working- and dosaging-set A and a melting device for continuous melting of crystal- or other sugar masses B and a cooling- and removal-

device D. In accordance with the present invention now between the two sets A and B of the entire arrangement, on the one hand, and the part D, on the other hand, selectively, a part C can be shifted in between, which part C as to its structure is adjusted to the desired production.

This part C to be shifted in can be for example a krokant set, as disclosed in FIG. 2, a coloring set, as disclosed in FIG. 3, a bar forming set, as disclosed in FIG. 4, or a covering set, as disclosed in FIG. 5. These exchangeable sets are suitable as to their measurements and as to their structure designed such, that they can be connected without difficulty to the already present sets A, B, and D.

Referring now again to the drawings, and in particular to FIG. 2, the krokant set comprises, for instance, substantially a cylindrical treatment chamber 2 with a feeding screw and working screw 1, respectively, mounted therein. The screw 1 is continuously driven with controllable speed by a drive 3. The walls of the treating chamber 2 are, as the feeding screw 1, heatable, and in particular, either electrically or by means of any suitable medium. Suitably the temperature and the heating of the feeding screw 1 and of the treating chamber 2 are controlled by thermostats, which are settable from the start to a predetermined temperature point.

It is of importance that the treating chamber is equipped with different entrance openings, sluices, or the like, for the feeding of the individual materials to be worked.

At the start of the feeding screw, that means at the start of the treating chamber 2, is arranged the entrance opening 4 for nuts, almonds, raisins or other solid bodies, whereby distributor rollers 5 or similar means are provided in the entrance funnel. Since the entire conveyor screw and also the treating chamber 2 are already correspondingly heated, the fed nuts or almonds have the possibility to heat themselves likewise, before they enter the range of the feeding position 6, in which fat milk, glucose or similar material is fed thereto. Also the here added materials have the possibility of heating during its transportation to the feeding position 7, which is disposed below the exit of the sugar melting device, so that the hot molten sugar is fed only at this position into the krokant set and into the treating chamber 2, respectively. The distance of the individual feeding positions from each other is chosen such, that the fed materials have always sufficient time to heat up to the required temperature, so that a solidification of the fed liquid hot sugar mass into the feeding opening 7 is not more possible. Behind the entrance position for the molten sugar a corresponding mixing and working of the individually fed materials takes place now by means of the conveyor screw 1. Under circumstances, at about the end of the feeding screw 1, a wobble mixing wheel 8 can be provided, which is driven by the feeding screw or separately and which serves the purpose to intensify the mixing through of the individual starting materials. For the same purpose can serve beating tools 9, wings or the like, mounted still to the end of the feeding screw 1. Finally, the finished worked and prepared krokant mass can be applied through the outlet 10 to the outlet- and cooling-device D.

If on the same arrangement instead of krokant, for instance, coloring material is to be produced, the krokant set, as disclosed in FIG. 2, is replaced by the coloring set, as disclosed in FIG. 3. The latter comprises again a treatment chamber 2' with the conveyor screw 1' working therein. At the one end of the treating chamber 2' the feeding position 7' is provided for the molten sugar. This feeding position is fed directly from the melting device. Sufficiently distant behind the feeding position 7' is provided a feeding position 11 for hot liquids, as water, sugar solution or the like. Finally, still behind the feeding position 11 for liquids so-called vapor outlet 12 is disposed, which is required, in order to remove the forming steam.

As in the other arrangements, also in the coloring set correspondingly arrangement temperature measuring devices, thermostats and sensing devices are provided. In particular, it is also necessary to adjust the fed sugar quantity and liquid quantity, respectively, exactly relative to each other by means of suitable dosaging devices.

Coloring is knowingly burnt or total caramelized double sugar, which is brought by the addition of water to a thin liquid consistency. The molten sugar flowing out of the sugar melting device, which is heatable in the same manner as the previously described krokant set, is browned to the designed end state. If the desired browning is obtained, the coloring mass is admixed within the range of the entering branch 11 with hot water. The water vapors developing during this process are removed by means of the vapor outlet 12. From the chamber outlet 10' the finished sugar coloring reaches the outlet and which sugar coloring is immediately worked further.

It is to be understood, that also coloring like products can be produced on the coloring set, which comprise glucose, malose or starch syrup. All raw materials are, as already mentioned, fed through dosaging devices fully automatically in the correct quantity. At this occasion, the possibility also exists, to add through the dosaging sets for instance caustic soda or salt of hartshorn.

The color set, as disclosed in FIG. 3, can be replaced also by a so-called bar-forming set, as shown on FIG. 4. This is used for the purpose, in order to produce fully automatically nut bars. A nut bar is to be understood to be a mixture of molten sugar and the most different types of nuts or also almonds or similar material, which is formed to bar-shaped pieces.

In the case of the bar-forming set, in accordance with FIG. 4, the treating chamber comprises three metal bands 13, 14 and 15 moving with the same speed, which define at their effective sides a U-shaped feeding channel between themselves. The bands are driven jointly by a drive (not shown) with controllable speed.

The band 15 forming the bottom of the feeding channel moves over an electric heating element 16 and through a heating zone, respectively. Behind the latter the band reaches into the working range of a vibrator 17, behind which is connected an air-cooling means 18.

At the start of the band arrangement, a feeding position 19 for nuts, almonds or the like is provided. The solid bodies fed through this feeding position 19 are equalized and distributed respectively, by means of an equalization roller 20 on the band 15. The heating element 15 takes care of the feature, that the solid materials fed at the position 19 are heated up so far, that the molten sugar masses fed in the feeding sluice 21 do not solidify.

The molten sugar is poured over the previously fed nuts or almonds or the like. Thereafter, the band arrangement is then displaced by the vibrator 17 into a joggling movement, so that the molten sugar can surround on all sides the solid material fed thereto.

Finally, in the band arrangement a thick liquid sugar-nut flow is formed. The latter reaches the range of the cooling zone 18 and is here cooled off so far by means of air streams fed through the nozzles 22 that it maintains its shape. It reaches at the end of the band arrangement a table 23 and can here be divided by a knife arrangement 24 into selectively large pieces. Finally, the pieces divided from the flow are transferred to the outlet- and cooling device D. From here the pieces can still be fed into a covering device or to a packing station. The cooling device D and the outlet device respectively can operate faster for a certain degree than the band arrangement formed in the treatment chamber, so that the pieces divided from the flow are separated from each other and can be cooled better.

Finally, it is also possible to replace the bar-forming device, in accordance with FIG. 4A and B, by a covering device in accordance with FIG. 5. The latter comprises substantially a correspondingly large continuously driven and heatable mixing drum 25 with feeding curves 26, disposed screwlike at the inside of the drum 26. In the feeding side of the drum 25 is provided a feeding screw arrangement 27, which is again heatable and which serves the purpose of feeding solid bodies, a nuts, almonds, popcorn, raisins and the like which are assigned from a dosaging device (not shown) and fed into the inside of the mixing drum 25. Simultaneously, a feeding funnel 28 projecting to about the drum center is provided over which feed-

ing funnel 28 the molten sugar arriving from the sugar melting device is fed. Also in this set, which serves the purpose of covering the solid bodies, as nuts, almonds, popcorn or the like, with a sugar layer, the previously described control possibilities are applied thereto. The solid materials are again preheated, so that an all-around cover of molten sugar can be formed fast and easily inside of the mixing drum.

On the outside of the mixing drum, individual pieces covered with sugar fall onto the cooling and outlet device D, as it has been described before. From this device, the individual parts are fed to a packing station, where they are packed in conventional manner.

While we have disclosed one embodiment of the present invention, it is to be understood that this embodiment is given by example only and not in a limiting sense.

We claim:

1. An arrangement for the selective production of sweets, as krokant- or coloring-masses, sugar-nut-bars, sugar-covered bars, almonds, popcorn, raisins or the like, comprising a raw material working- and dosaging-set, a device for continuous melting of crystal- or other sugar masses, a cooling- and delivery-device for the finished products, a krokant set, a coloring set, a bar set and a covering set for nuts, almonds, popcorn, raisins or the like being selectively operatively connected between said raw material working- and dosaging-set and said melting device, on the one hand, and said cooling- and delivery-device, on the other hand, each of said intermediate sets comprising a treating chamber with transportation- and working-tools operating in said treating chamber, and said treating chambers having feeding positions separated from each other for said masses to be worked.
2. The arrangement, as set forth in claim 1, wherein said treating chamber of said krokant set includes a continuously driven, heatable and rotating feeding screw and heatable walls, selectively feeders and sluices for the separate feeding of solid bodies, of liquid masses and of molten sugar emerging from said melting device are disposed in series in said treating chamber in the direction of feeding, and selectively tools, mixing apparatus and beating apparatus following said feeder and sluices.
3. The arrangement, as set forth in claim 1, wherein said coloring set comprises a continuously driven feeding screw rotating in said treating chamber having heatable walls, a feeding means or sluice provided at one end of said treating chamber for the molten sugar emerging from the melting device, a liquid feed following said feeding means in the direction of conveyance for hot water, sugar solution, and a vapor removal means provided in said treating chamber.
4. The arrangement, as set forth in claim 1, wherein for the formation of said bar set said treating chamber comprises conveyor bands moving parallel to each other with equal speed defining therebetween a U-shaped feeding channel, and in the direction of conveyance in series is disposed behind each other within the range of the heating zone a feeding station for solid bodies, thereafter a feeding apparatus for the molten sugar emerging from said melting device, and a device increasing the density of the material to be worked, a following cooling zone for solidification of the line of masses, and a dividing device is provided.
5. The arrangement, as set forth in claim 1, wherein said covering set comprises substantially a heatable rotating mixing drum with a feeding curve extending screwlike on the inner wall of said mixing drum,

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a heatable screw is preceding said mixing drum for the continuous feeding of solid bodies, and
a feeding funnel is disposed inside of said screw for the sugar emerging from said melting device.
6. The arrangement, as set forth in claim 1, which includes 5
sensing devices for the continuous control and for the auto-

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matic regulation of the temperature conditions and for the quantitative dosaging of the individual masses to be worked, as well as for the control of the passing-through speed provided in the treating chamber of each of said sets and on said complementary feeding means.

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