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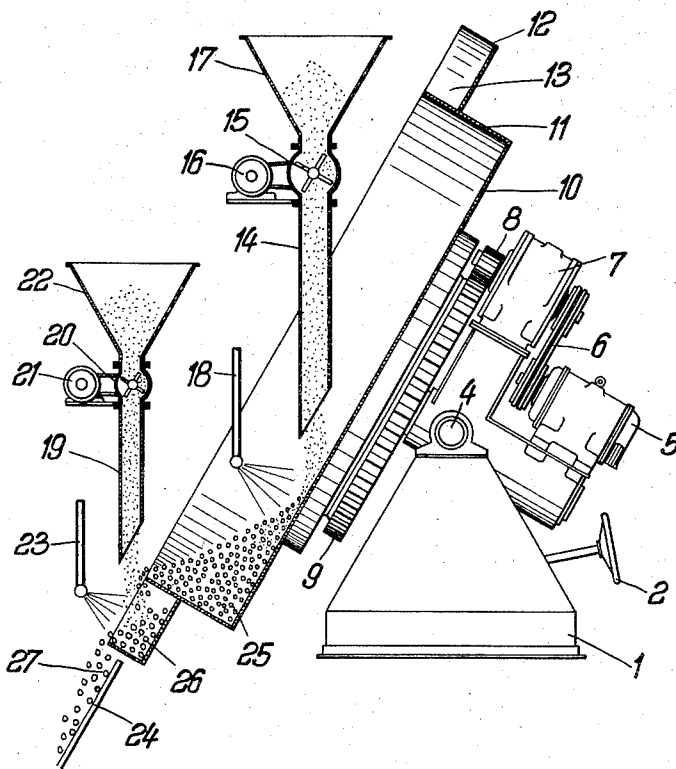
2,860,598

PRODUCTION OF GRANULATED MATERIALS CONSISTING
OF A CORE AND ONE OR MORE SHELLS

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2 Sheets-Sheet 1

Fig. 1



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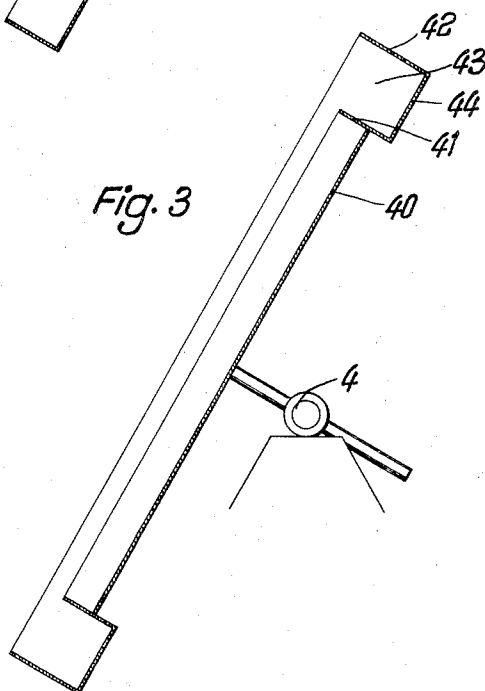
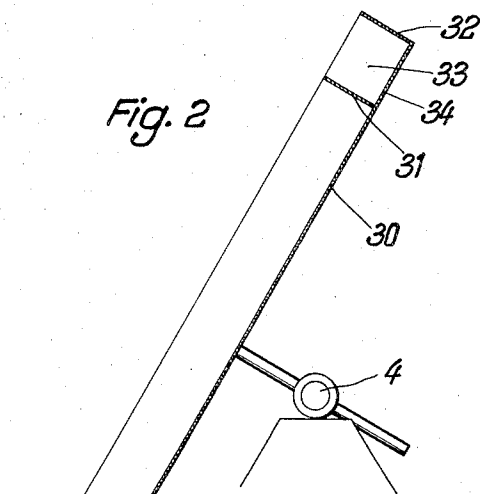
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PRODUCTION OF GRANULATED MATERIALS CONSISTING OF A CORE AND ONE OR MORE SHELLS

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4 Claims. (Cl. 118—418)

In the industry for the production of hydraulic binding media and in the chemical industry it is necessary for the subsequent treatment of certain materials, that the raw substances shall be formed into granulations. In the formation of the granulations the procedure is such that they are deposited in powder form, while being sprayed, on a rotating surface, the granulations forming during the rolling motion of the material on its supporting surface.

In many branches of industry it is desirable, that in the granulations the core shall consist of a different material from that of the later formed shell or that the core shall be enveloped in several shells consisting of different materials.

The devices according to the invention provide the possibility of producing in a single device granulations, in which the core consists of a different material from the shell. The device consists of an inclined rotating plate which is surrounded at its outer periphery by an annular channel open at the top, which takes part in the rotary motion of the plate. Both the plate and the annular channel have at their outer periphery each a retaining rim. There is also provided in each case in the region of the plate and in the region of the annular channel a filling device with a spraying device. The device operates in such a manner that in the first place there is fed on to the rotating plate material in powder form, which, while being deposited, is sprayed with water. The material performs a rolling motion on the bottom of the plate, so that granulations are formed. The granulations pile up on the lower side of the plate. As soon as they have reached a certain height, the granulations fall over the retaining edge into the outer annular channel. In the region of this annular channel the granulations are sprinkled with a powdery material, the purpose of which is to form a shell about the granulation core. At the same time the granulations are also sprinkled with water for causing the formation of the shell. It will be obvious, that such a device can be supplemented by a further annular channel, in which a further shell is formed.

For the construction of the rotary plate and of the annular channel and for the disposition of the annular channel at the rotary plate various possibilities are presented. The bottom of the annular channel may be arranged above the plane of the bottom of the plate or in the same plane. The retaining rims may finish at the same height in regard to the bottom of the plate. In some cases, however, it may be of advantage to place the bottom of the annular channel lower than the bottom of the plate, so that the cross sectional area of the annular channel is enlarged. This constructional form may be of special advantage, where the granulations are to be given a shell of greater thickness.

Thus, the invention further relates to a method of producing granulations consisting of a core and one or more shells. According to the invention the rotary plate is fed with different material from that fed to the annular channel, so that granulations are formed, the core of which

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consists of different material from that of the shell. Furthermore, according to the invention the annular channel may be fed successively with different material, so that granulations with several shells are formed, of which each shell consists of a different material.

In the accompanying drawings three constructional examples for the device according to the invention are illustrated.

Figure 1 shows in side elevation a complete device, in which the rotary plate with the annular channel and the means for feeding the material are shown in section;

Figure 2 shows diagrammatically a constructional form for a different arrangement of the annular channel and

Figure 3 shows another constructional form for a further form and arrangement of the annular channel at the rotary plate.

The plate arrangement is mounted on a support 1. At the upper end of this support the plate arrangement along with the driving members is supported pivotally, so as to be capable of rocking on a pivot pin 4. By means of the hand wheel 2 the inclined position of the rotary plate can be adjusted. The drive of the rotary plate is provided for instance by an electric motor 5, the driving power of which is transmitted by way of V-belts 6, gearing 7 and a gear wheel 8 to a ring of teeth 9 which is rigidly fixed to the rotary plate. The rotary plate itself consists of the bottom 10 and a retaining rim 11. At the outer periphery of the retaining rim 11 an annular channel 13 is provided, which is open at the top and is also provided with a retaining rim 12. In this constructional example the bottom of the annular channel 13 lies above the plane of the plate bottom 10 and the retaining rim 12 is flush with the retaining rim 11. Above the plate bottom 10 is a filling arrangement for supplying the plate with powdery material. The filling arrangement consists of a filling pipe 14, a bucket wheel 15 and a hopper 17. The bucket wheel 15 is driven by an electric motor 16. Laterally of this filling arrangement is provided a spraying arrangement 18 which sprays with water the material as it falls out of the filling pipe 14. A similar arrangement is provided in the region of the annular channel 13. The filling arrangement for the powdery material also consists of the filling pipe 19, the bucket wheel 20 and the hopper 22, the bucket wheel 20 being driven by an electric motor 21. Laterally of this filling arrangement is the spraying device 23 which operates in the same way as the spraying device 18. It is also provided with a chute 24, on to which the granulations which are provided with shells fall. In the region of the plate consisting of the bottom 10 and the retaining rim 11 the granulation cores 25 are formed, which consist of the material supplied by the conveying device 14, 15. These granulation cores 25 fall over the retaining rim 11 into the annular channel 13, where they are dusted with another material from the filling arrangement 19, 20, the formation of the shell taking place under spraying with water.

In Figures 2 and 3 there are only shown two constructional examples for the arrangement for the annular channel. In the constructional example according to Figure 2 the bottom 34 of the annular channel 33 lies in the same plane with the bottom 30 of the rotary plate. The retaining rims 31 and 32 terminate at the same height. In the constructional example according to Figure 3 the bottom 44 of the annular channel 43 lies lower than the bottom 40 of the plate. The retaining rim 42 extends above the top of the retaining rim 41.

I claim:

1. Apparatus for producing granulations comprising a core and shell, which apparatus comprises a container of circular form and adapted to rotate about an axis inclined to the vertical and having an annular partition

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dividing the space inside said container into a central zone and an annular outer zone, both zones being open at the top, means adapted to drive the container in rotation, a filling device adapted to discharge powdered core material into the central zone, spraying means adapted to spray moisture into the central zone, a further filling device adapted to discharge powdered shell material of a different nature from the core material, into the outer zone and further spraying means adapted to spray moisture into the outer zone, whereby granulations formed in the central zone are discharged over the partition into the outer zone and are provided with a shell in the outer zone.

2. Apparatus as claimed in claim 1, in which the bottom of the outer zone is arranged at the same level as the bottom of the central zone and a peripheral outer wall of the container is of the same height as the partition.

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3. A device as claimed in claim 1, in which the bottom of the outer zone is lower than the bottom of the central zone and a peripheral outer wall of the container extends above the top of the partition.

4. Apparatus as claimed in claim 1, comprising means adapted to change the inclination of the axis of rotation of the container.

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