

Description

The invention relates to an apparatus for preparing the composition for road surfacing material comprising stone chippings and recycled asphalt having a horizontal drum rotating about its longitudinal axis, a burner at the one end of the drum with its flame directed in the longitudinal direction of the drum, a feeder for the asphalt and a means for removing the heated mixture of stone chippings and asphalt at the same end of the drum and a feeder for the stone chippings at the other end of the drum, the burner and the asphalt feeder being associated with one another in such a way that the asphalt enters the drum without coming into direct contact with the burner flame.

When preparing the composition for road surfaces using bitumen, the road surfacing material consists essentially of bitumen or of asphalt and stone chippings of different sizes. Stone chippings of coarse size serve for the construction of a supporting structure; stone chippings of smaller size to a certain extent fill in the cavities of the supporting structure and the bitumen or the asphalt penetrating the road surface thus prepared joins the stone chippings together and fixes them in position.

With this preparation of a road surface, attention must be paid to the fact that the individual ingredients of the road surface are applied in the correct mixing ratio. This is important in particular in cases when the individual ingredients are not applied successively in the surface region, that is to say firstly constructing the supporting structure of coarse stone chippings, then allowing stone chippings of smaller size to penetrate the cavities of the supporting structure and finally applying the bitumen or the asphalt, but when the road surfacing mixture is firstly prepared separately and then applied as a whole to the substructure of the road surface. Processes of this type are applied in particular for reasons of using as rational a method as possible. The

individual ingredients are compiled in mixers and well mixed, then heated to the processing temperature in order finally to be processed, i.e. to be applied to the road substructure.

5 With a known process of this type, the stone chippings of different sizes and in the correct mixing ratio are fed from a number of feeding funnels corresponding to the number of different stone sizes onto a conveyor belt and passed into a horizontal drum which rotates about its
10 longitudinal axis. The stone chippings are introduced into the drum at the one end and conveyed to the other end of the drum while the drum is rotating. Projecting into the drum from this other end of the drum is a burner, of which the direction of the flame is opposed
15 to the direction of transport of the material and which heats the said material to approximately 200°C.

 While the material is being transported through the drum, dust and moisture are extracted with the result that stone chippings are removed at the end of the drum
20 which are dried, pre-heated and freed from dust. The stone chippings leaving the drum in a thus prepared state in the desired composition of sizes are introduced by means of a bucket conveyor into a classifying device with a weighing machine in which an appropriate portion of the
25 previously extracted dust is again added to the stone chippings as well as bitumen and a predetermined quantity of filler. In order to obtain the desired processing temperature, the bitumen is added at a temperature of 165°C and the filler at a temperature of 10°C. The mixture with
30 the mixing portions guaranteed by the weighing machine is finally well mixed in a twin-shaft pug mill and is available for processing, i.e. for applying to the road substructure.

 With this universally applied process, a road
35 surface mixture is achieved of good processability; a road surface can be prepared which meets all demands. However, the process has the disadvantage that this positive result is achieved at relatively large outlay. The plant necessary for performance of the process is

very costly in construction and operation. Additionally, with this process, it is not intended and not possible either to re-use an old road surface, i.e. to incorporate an appropriate degree of an old road surface into the process of preparation of the new road surface.

5 A plant which is more simple in construction is known from AT-B-236,886. However, it only serves for drying and classifying the additional material for bituminous road building materials and, consequently, has
10 a feeder for the stone at one end of the drum, a burner and a discharge device at the other end of the drum and a screen arrangement surrounding the drum with screens of different mesh. The dried stone is fed to this screen arrangement and packed into a plurality of receptacles
15 for stone of different sizes.

An apparatus is also known for preparing bituminous mixed material with accompanying use of recycled asphalt, in which the stone chippings are fed at the one end of a horizontal drum and the asphalt is fed at the other end
20 of the drum at which a burner is located, the removal of the finished mixed material also being effected at the end of the drum where the burner is located and the asphalt is fed (DE-A-3,109,573). The invention sets out from this solution. The known solution fulfils the fact
25 of using recycled asphalt mainly by the addition of asphalt to the drum being effected in such a way that the recycled asphalt is not to be directly affected by the hot smoke gases and the heat required for replasticizing the recycled asphalt arises primarily from the heated
30 fresh minerals. In order to make this possible, the recycled asphalt must be introduced at varying depths into the drum independently of the size, and control of the burner capacity must be dependent on the temperature of the mixed material.

35 The object of the present invention is to make the known plant more simple and more practicable.

The object is achieved by the features of the characterizing part of Claim 1 whilst the feature of Claim 2 describes an expedient embodiment of the

invention.

5 The invention is described in greater detail below with reference to the drawing. The drawing illustrates schematically an apparatus according to the invention with the possibility of feeding in old road surfacing material.

10 A drum 2 with a horizontal longitudinal axis 3 is mounted rotatably about this longitudinal axis in a stationary housing 1. Projecting into the drum 2 from the end of the drum which is on the left in the illustration is a burner 4, of which the longitudinal axis of the flame coincides with the longitudinal axis 3 of the drum. The burner can basically be of any type and can be operated by gas or oil. The drive of the drum 2 is effected by a motor (not illustrated) via a transmission, which encloses a track ring 5 surrounding and firmly connected to the drum. At the lower end, a plurality of so-called hot silos 6 is arranged successively in the longitudinal direction of the drum adjacent to the housing. These hot silos are funnel-shaped receptacles largely insulated against heat radiation which, in a manner to be described below, receive stone chippings of different particle size departing from the drum 1 mixed with bitumen or asphalt and feed it to a conveyor belt for further processing.

25 In order to be able to classify the material, sizing screens 7 are arranged on the drum 2 successively in the longitudinal direction of the drum in such a way that between the jacket of the drum 2 and the sizing screens 7 there is an annular chamber 8. The sizing screens have different mesh widths, the sizing screen 7a with the largest mesh width being located on the right side of the drum 2 in the drawing, and sizing screen 7d with the smallest mesh width being located on the left end of the drum 2 in the drawing. The annular chamber 8 is connected to the inner chamber of the drum 2 via apertures 9 which, at the left end of the drum in the drawing, are distributed evenly on the circumference of the drum.

When operating the plant, different material is now

fed into the drum 2 at both ends of the drum by a feeder 10 and 11 respectively. Via the feeder 10 at the right end of the drum facing away from the burner 4, new material in a cold state, that is to say in particular stone chippings of different size, is fed into the drum and this material travels towards the flame of the burner 4 and, in this way, is heated to the desired temperature. Via the feeder 11 at the end of the drum where the burner is located, recycled asphalt is fed into the drum. The feeder 11 is to be constructed and arranged in such a way that, although the recycled asphalt is heated to the desired temperature, it is not ignited and does not begin to burn. The input hood or the elbow 11a is therefore passed through the flame zone of the burner 4 and is located with the outlet opening 11b below the flame zone and is directed downwards. Mixing of the recycled asphalt introduced via the feeder 11 and the fresh material introduced via the feeder 10 takes place in the region of the discharge apertures 9; the recycled asphalt is heated by the passing of the hood 11a through the flame zone and by the absorption of heat from the fresh material; ignition of the asphalt is largely ruled out. The recycled asphalt is located in the mixing drum for a relatively short time, it is heated without direct contact with the flame and during heating is mixed well with the heated stone chippings coming from the other end of the drum. The mixture of recycled asphalt and stone chippings travels through the apertures 9 into the annular chamber 8 and from there, classified according to the respective particle size, into the hot silos 6, and can be removed from these for further processing.

Extraction of the dust and moisture is effected by a flue gas stack 19 at the end of the drum where feeder 10 is located.



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Patent claims

1. Apparatus for preparing the composition for road surfacing material comprising stone chippings and recycled asphalt having a horizontal drum (2) rotating about its longitudinal axis (3), a burner (4) at the one end of the drum (2) with its flame directed in the longitudinal direction of the drum (2), a feeder (11) for the asphalt and a means for removing the heated mixture of stone chippings and asphalt at the same end of the drum and a feeder (10) for the stone chippings at the other end of the drum, the burner (4) and the asphalt feeder (11) being associated with one another in such a way that the asphalt enters the drum (2) without coming into direct contact with the burner flame, characterized by the following features:

1.1 For classifying the stone chippings mixed with the recycled asphalt, a known classifying device is associated with the drum (2), the stone chippings being introduced into the drum (2) at the other end of the drum, the mixture of stone chippings and asphalt being removed from the drum at the one end and fed to an annular chamber (8) between the drum and the classifying screens (7) surrounding the drum and passing through the classifying screens into hot silos (6).

1.2 The still unclassified mixture of stone chippings and asphalt departs from the drum into the said annular chamber (8) through apertures (9) in the drum wall at the one end of the drum.

1.3 In the region of the said apertures (9) in the drum wall, the asphalt enters the inside of the drum by means of an elbow (11a) which is passed through the flame zone of the burner (4).

2. Apparatus according to Claim 1, characterized by an arrangement known per se of a dust extraction device (19) at that end of the drum (2) where the stone chippings feeder (10) is located.

As printed

Claims

1. An apparatus for preparing the composition for road surfacing material comprising stone chippings and recycled asphalt, the apparatus comprising: a horizontal drum (2) rotating around its longitudinal axis (3); at one end of the drum (2) a burner (4) whose flame is directed lengthwise of the drum (2); a feeder (11) for the asphalt; and means for removing the heated mixture of stone chippings and asphalt at the same end of the drum; and a feeder (10) for the stone chippings at the other end of the drum, the burner (4) and the asphalt feeder (11) being so associated with one another that the asphalt enters the drum (2) without coming into direct contact with the burner flame, characterised by the following features:

1.1 For sizing the stone chippings mixed with the recycled asphalt a known sizing device is associated with the drum (2), the stone chippings being introduced into the drum at the other end thereof and the mixture of stone chippings and asphalt being removed from one end of the drum and being supplied to an annular chamber (8) between the drum and sizing screens (7) disposed therearound and passing through such screens into hot silos (6);

1.2. The still unsized mixture of stone chippings and asphalt issues from the drum into the annular chamber (8) through apertures (9) in the drum wall at one end of the drum, and

1.3 Near the apertures (9) in the drum wall the asphalt is introduced into the drum interior by means of an elbow (11a) which extends through the flame zone of the burner (4).

2. An apparatus according to claim 1, characterised by a known arrangement of a dust removal device (19) at that end of the drum (2) where the stone chippings feeder (10) is disposed.

Revendications

1. Dispositif pour la préparation d'un mélange pour un revêtement routier à base de pierres concassées et de vieux asphalte, avec un tambour horizontal (2) tournant autour de son axe longitudinal (3), un brûleur (4) placé à une extrémité du tambour (2) et dont la flamme est dirigée dans l'axe longitudinal du tambour, un appareil d'alimentation (11) en asphalte et un appareil de prélèvement de mélange chauffé de pierres concassées et d'asphalte à la même extrémité du tambour ainsi qu'un appareil d'alimentation (10) en pierres concassées à l'autre extrémité du tambour, le brûleur (4) et l'alimentation en asphalte (11) étant associés l'un à l'autre de manière que l'asphalte arrive dans le tambour sans avoir été directement exposé à la flamme du brûleur, caractérisé par les caractéristiques suivantes:

1.1 pour le triage des pierres concassées mélangées au vieux asphalte, un dispositif de triage connu est associé au tambour (2), les pierres concassées étant introduites dans le tambour (2) à l'autre extrémité du tambour, le mélange de pierres concassées et d'asphalte étant prélevé à une extrémité du tambour et envoyé à un espace annulaire (8) entre le tambour et des tamis de triage (7) entourant le tambour, ce mélange arrivant, après avoir traversé les tamis de triage, dans des silos à chaud (6).

1.2 la sortie du mélange d'asphalte et de pierres concassées, encore non trié, à partir du tambour dans l'espace annulaire mentionné (8), a lieu à travers des ouvertures (9) de la paroi du tambour à une extrémité du tambour.

1.3 l'introduction de l'asphalte à l'intérieur du tambour a lieu dans la zone des ouvertures mentionnées (9) au moyen d'un coude (11a) guidé à travers la zone de flamme du brûleur (4).

2. Dispositif selon la revendication 1, caractérisé par la disposition en soi connue d'un dispositif (19) d'extraction de poussière à l'extrémité du tambour (2) où se trouve l'appareil (10) d'alimentation en pierres concassées.

