

Mixing device for mixing a liquid plastics component with a gas

The invention concerns a mixing device for mixing a liquid plastics component with a gas having the features of the classifying portion of claim 1.

5 Mixing devices of the general kind set forth (see for example EP 0 776 745 B1) serve for producing a mixture of a liquid plastics component and a gas, wherein the mixture is under a pressure above atmospheric pressure. The gas is homogeneously distributed by the agitator device at least for the major part in the liquid plastics component. When that mixture is discharged from the discharge opening a pressure
10 drop occurs after passing through components which are usual in the state of the art (at least a metering pump and a valve device), the gas causes the liquid plastics component to foam and after hardening of the foamed plastic component the result is a plastic portion which is provided with pores, for example in the form of a sealing bead.

15 If the mixing device is inactive over a prolonged period of time gas which is already in the liquid issues from the mixing chamber through that seal which seals off the mixing chamber in the region of the shaft. When the mixing device is activated after the stoppage time the mixture which is to be discharged by way of the discharge opening is provided with too little gas and an inadequate foaming process occurs.

20 The object of the invention is to provide a mixing device in which the above-described problems are avoided.

That object is attained by a mixing device having the features of claim 1. Advantageous embodiments of the invention are defined in the appendant claims.

25 The gas which has issued from the mixing chamber through the seal passes on the side of the seal, that is remote from the mixing chamber, into the reservoir which is arranged there and is received by the liquid plastics component which is disposed there. When the mixing device is set in operation again the liquid plastics component provided with the gas flows out of the reservoir by way of the line which connects the reservoir to the mixing chamber, into the mixing chamber again and is
30 there homogenized by the agitator device with the liquid plastics component which has too little gas.

Embodiments of the invention are described with reference to single Figure 1.

Figure 1 shows a mixing device 1 for mixing a liquid plastics component with a gas. The mixing device 1 has at least one liquid feed 2, at least one gas feed 3 and a
35 discharge opening 11 for the mixture produced in the mixing device 1. The liquid feed

2, the gas feed 3 and the discharge opening 11 are respectively connected to a mixing chamber 4 in which a rotatable agitator device 5 is arranged. A shaft 6 for driving the agitator device 5 projects out of the mixing chamber 4. In the region of the shaft 6 the mixing chamber 4 is sealed off by at least one seal 7 which in the illustrated example is an annular seal. The gas feed 3 is provided in that region with a non-return valve.

If gas issues from the mixing chamber 4 in particular in a stoppage condition that gas passes to the side 10, that is remote from the mixing chamber, of the at least one seal 7. Disposed there is a reservoir 8 which is connected to the at least one liquid feed 2 and which is filled with the liquid plastics component and which is delimited by the seal 7 or the side 10 thereof, that is remote from the mixing chamber. That reservoir 8 is connected to the mixing chamber 4 by way of a line 9.

If substantially the same pressure prevails in the reservoir 8 and the mixing chamber 4 that reduces the rate at which gas issues from the mixing chamber 4 into the reservoir 8.

It is also possible to see in Figure 1 two further annular seals 13 which delimit or seal off the reservoir 8 with respect to the shaft 6.

A non-return valve 14 is arranged in the line 9. That can exclude a massive backflow in the event of leakage in the region of the reservoir 8. In addition the housing 16 of the mixing chamber 4 is surrounded by a cooling casing 12. The cooling casing 12 defines a cooling chamber 15 through which can flow a fluid for cooling the mixing chamber 4.

List of references:

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| | 1 | mixing device |
| | 2 | liquid feed |
| 5 | 3 | gas feed |
| | 4 | mixing chamber |
| | 5 | agitator device |
| | 6 | shaft |
| | 7 | seal |
| 10 | 8 | reservoir |
| | 9 | line |
| | 10 | side of the seal 7, that is remote from the mixing chamber |
| | 11 | discharge opening |
| | 12 | cooling casing |
| 15 | 13 | further seal |
| | 14 | non-return valve |
| | 15 | cooling chamber |
| | 16 | housing |

CLAIMS

1. A mixing device (1) for mixing a liquid plastics component with a gas, comprising at least one liquid feed (2), at least one gas feed (3) and a discharge opening (11) for the mixture produced in the mixing device (1), which are respectively
5 connected to a mixing chamber (4) in which a rotatable agitator device (5) is arranged, wherein a shaft (6) for driving the agitator device (5) projects out of the mixing chamber (4) and the mixing chamber (4) is sealed off in the region of the shaft (6) by at least one seal (7), characterised in that arranged on the side (10) of the at least one
10 seal (7), that is remote from the mixing chamber, is a reservoir (8) which is connected to the at least one liquid feed (2) and which is connected to the mixing chamber (4) by way of a line (9).

2. A mixing device as set forth in claim 1 characterised in that the seal (7) is of
15 an annular configuration.

3. A mixing device as set forth in claim 1 or claim 2 characterised in that the seal (7) delimits the reservoir (8).

20 4. A mixing device as set forth in at least one of the preceding claims characterised in that the mixing device (1) includes at least one further – preferably annular – seal (13) which seals off the reservoir (8) with respect to the shaft (6).

5. A mixing device as set forth in at least one of the preceding claims
25 characterised in that a non-return valve (14) is arranged in the line (9).

6. A mixing device as set forth in at least one of the preceding claims characterised in that a housing (16) delimiting the mixing chamber (4) is surrounded by a cooling casing (12), wherein the cooling casing (12) delimits a cooling chamber (15)
30 through which a fluid for cooling the mixing chamber (4) can flow.