

Description

Technical Field

The invention relates to a device for dispensing flowable material from a bag.

Background Art

Frequently it is desirable to dispense a flowable material, such as filling resins from a bag without coming into contact with the atmosphere or with human skin. Also, it may be desirable to close off the dispensing device after dispensing only a portion of the contents of the bag.

German application DE-A-25 25 000 discloses a dispensing device in which an annular part is included in the bag and an exterior dispensing part mates with the annular part through the wall of the bag to dispense the flowable material. In that device the wall of the bag is cut by a central conical tip on the dispensing part which has an opening in its side wall through which the flowable material must pass. However, with that dispensing device, the conical tip may not sever but rather merely depress the bag wall into the sealing part, particularly with thick-walled or double-walled bags. Even if the bag wall is severed, an insufficient and/or non-uniform opening may result. Moreover, the throughgoing passage has an angled configuration and has a relatively small cross-section thereby limiting the types of flowable materials that can be dispensed and the flow rate from the bag.

US-A-4 076 147 discloses a dispensing device according to the pre-characterising part of claim 1.

The object of the invention is to improve this device, in particular to improve the severance of the bag and the engagement of the two parts of the device.

This object is attained by a device according to claim 1.

Disclosure of Invention

According to this invention there is provided a device for dispensing flowable material through a flexible wall of a bag, comprising an annular sealing part in the bag, and a dispensing part outside of the bag and being adapted to be mated with the sealing part as the wall of the bag is severed to form a throughgoing connection sealed against the wall, the sealing part and the dispensing part each having an annular sealing surface that surrounds an opening through the part, which sealing surface may be brought into sealing engagement with the bag wall between them, and cutting means on the dispensing part in the area thereof that is surrounded by its sealing surface said cutting means

being adapted to be inserted in said opening of said sealing part so as to cut through the wall of the bag as the sealing surfaces are brought into sealing engagement, characterised in that said parts comprise cooperating interlocking means, including at least one resilient member, adapted to engage the wall of the bag between them and stretch the wall of the bag taut, before the cutting means cuts the wall of the bag, and said cooperating interlocking means being adapted to subsequently engage in an interlocking position for maintaining said parts in sealed and mating engagement.

The interlocking means will grip and stretch the bag wall taut in an early phase of the plugging step outside of the area surrounded by the sealing surfaces, whereby the cutting means can engage the bag wall more effectively, and can sever it more reliably and more uniformly. The risk is thereby avoided that areas of the bag wall will be deformed towards the interior of the bag without being severed. Towards the end of the mating process, the interlocking means will engage in their interlocking position and hold the device safely together. Since the interlocking means are arranged outside of the areas surrounded by the sealing surfaces they do not restrict the flow cross-section of the throughgoing connection.

Brief Description of the Drawings

In the drawing:

Figure 1 is a perspective view of a device according to the invention and a bag prior to the mating of the sealing part and the dispensing part;

Figure 2 is a perspective view of the sealing part of the dispensing device illustrated in Figure 1;

Figure 3 is a perspective view of the dispensing part of the dispensing device illustrated in Figure 1;

Figure 4 is an illustration like that of Figure 1 with the sealing part and the dispensing part mated on the bag;

Figure 5 is a partial axial sectional view of a second embodiment of the dispensing part; and

Figure 6 is a partial axial sectional view of a third embodiment of the dispensing part.

Best Modes for Carrying Out the Invention

Figures 1 and 3 show a bag 1 which is filled with a flowable material, for instance a filling resin for use in producing a waterproof enclosure around a splice in a telephone cable. The bag is welded shut along its edge 3. In the flowable material in the interior of the bag, there is an annular sealing part 5 which is made of a material, for instance a

plastic, that is compatible with the flowable material. The sealing part 5 may, if desired, be attached to the interior wall of the bag.

The sealing part 5, has a radial sealing surface 9, 11 and a conical sliding surface 13, 15, respectively, on both sides of a central plane. The sliding surfaces 13 and 15 lead to an outer annular snapping depression 17 in the central plane 7. The sealing part 5 has an axial throughgoing opening 19 bordered by the sealing surfaces 9 and 11.

Exteriorly of the bag, there is a dispensing part 21. It includes a dispensing tube 23 to which, for example, a dispensing conduit (not illustrated) may be connected by a thread 25 on the end of the dispensing tube. The dispensing tube 23 forms an axial throughgoing opening 27 and ends in a flange 29 on which an essentially annular radial sealing surface 31 is provided on the side facing away from the dispensing tube 23. The sealing surface 31 matches each of the two sealing surfaces 9, 11 of the sealing part 5. Within and close to the sealing surface 31, about ten thin-walled cutting teeth 33 are provided around the circumference of the throughgoing opening 27. In the illustrated embodiment the teeth 33 extend around 270° of the circumference of the opening. These cutting teeth 33 project axially beyond the sealing surface 31.

From the outer edge of the flange 29, resilient snapping tongues 35 depend exteriorly of the sealing surface 31 in the same direction as the cutting teeth 33. The snapping tongues 35 have interiorly depending free end areas 37. The surfaces of the end areas 37 which engage with the bag wall upon the mating of the sealing part and the dispensing part are dimensioned so, taking into account the spring force of the snapping tongues 35, that a desired frictional pressure is exerted on the bag wall. That frictional pressure is such that the wall is frictionally entrained and stretched taut, but not torn, by the snapping tongues.

During assembly a dispensing part 21 is mated with the sealing part 5 by positioning it over the sealing part and pressing it down on the area of the bag wall that covers the sealing part. Upon mating of the sealing part and the dispensing part, an area of the bag wall is initially engaged and stretched taut between the free end portions 37 of the snapping tongues 35 and the opposed sliding surface 13. The free end areas 37 of the snapping tongues 35 continue to slip on the bag wall supported by the sliding surface 13 until they snap into the annular snapping depression 17 of the sealing part 5 (with the bag wall interposed) at the end of the mating process. Thereby, a strong interlocking connection is formed between the sealing part 5 and the dispensing part 21. The dimensions are selected so that in the snapped-in condition illustrated in Figure 4, the bag wall is clamped and sealed

between the sealing surfaces 9 and 31 of the sealing part 5 and the dispensing part 21, respectively. Prior to reaching the snapped-in final position, the cutting teeth 33 cut asymmetrically into the stretched area of the bag wall and tear a hole into the bag wall so that a straight throughgoing passage for withdrawing the flowable material is created.

Figures 5 and 6 illustrate alternative embodiments of the dispensing part. In Figures 5 and 6, parts which correspond to parts in Figures 1 through 4 are designated with the same reference numerals as there, however, with a precedent number 5 or 6, respectively. Insofar as like reference numerals apply, reference is made to the description with respect to Figures 1 through 4.

Figure 5 illustrates an embodiment of a dispensing part 521 in which an additional sealing ring is provided in the form of an annular disc 39 in the space between the interiorly projecting free end areas 537 and the sealing surface 531 of the flange 529.

Figure 6, shown in an illustration similar to Figure 5, is an embodiment of a dispensing part 621 in which a unitary annular sealing ridge 41 is provided on the sealing surface 631 of the flange 629. A corresponding sealing ridge can be additionally provided also in the embodiment according to Figure 5 (not illustrated). Such a sealing ridge can be generally provided on one of two cooperating sealing surfaces to improve the sealing effect.

In the embodiment according to Figure 6, the snapping tongues 635 are surrounded by an axially displaceable securing ring 43 provided for increasing the interconnection force between the sealing part and the dispensing part. During the mating of the parts, the securing ring 43 is held in a neutral position close to the flange 629, i.e. distant from the free end areas 637 of the snapping tongues 635, so that it does not disturb the function of the snapping tongues 635. After the mating, the securing ring 43 is moved into a securing position shifted towards the free end areas 637, in which it secures the snapping tongues 635 against outward movement and thus secures the obtained connection against disengagement. The interconnecting force can be still further improved if, as illustrated in Figure 6, the outer diameter defined by the snapping tongues 635 increases slightly towards the free end areas 637. In Figure 6, that slight increase is shown exaggerated for reasons of clarity. The increased interconnection force may be particularly desirable if highly viscous material is to be dispensed from a bag with the application of high pressing forces.

Claims

1. A device for dispensing flowable material through a flexible wall of a bag, comprising an annular sealing part (5) in the bag (1), and a dispensing part (21) outside of the bag (1) and being adapted to be mated with the sealing part (5) as the wall of the bag is severed to form a throughgoing connection sealed against the wall, the sealing part (5) and the dispensing part (21) each having an annular sealing surface (9, 11, 31) that surrounds an opening (19, 27) through the part, which sealing surfaces (9, 11, 31) may be brought into sealing engagement with the bag wall between them, and cutting means (33) on the dispensing part (21) in the area thereof that is surrounded by its sealing surface (31) said cutting means (33) being adapted to be inserted in said opening of said sealing part (5) so as to cut through the wall of the bag (1) as the sealing surfaces (9, 11, 31) are brought into sealing engagement, characterised in that said parts (5, 21) comprise cooperating interlocking means (13, 15, 17, 35, 37), including at least one resilient member, adapted to engage the wall of the bag between them and stretch the wall of the bag (1) taut, before the cutting means (33) cuts the wall of the bag, and said cooperating interlocking means (13, 15, 17, 35, 37) being adapted to subsequently engage in an interlocking position (Figure 4) for maintaining said parts (5, 21) in sealed and mating engagement.
2. The dispensing device of claim 1, characterised in that the interlocking means comprise a snapping depression (17) at the outer circumference of the sealing part (5) and an essentially conical sliding surface (13, 15) leading to the snapping depression, and resilient snapping tongues (35) on the dispensing part (21) which mate with the snapping depression (17).
3. The dispensing device of claim 2, characterised in that the annular sealing part (5) comprises on both sides of a central plane (7), a sealing surface (9, 11) and an essentially conical sliding surface (13, 15) leading to a snapping depression (17) at the central plane.
4. The dispensing device of claim 2 or 3 characterised in that the snapping tongues (35) comprise interiorly projecting free end areas designed to obtain a frictional entrainment of the bag wall to stretch the wall of the bag taut before the cutting means cuts the wall of the bag.
5. The dispensing device of claim 1, characterised in that the cutting means (33) consist of a

plurality of cutting teeth.

6. The dispensing device of claim 5, characterised in that the cutting teeth are distributed around the circumference of the opening (27) through the dispensing part (21).
7. The dispensing device of claim 6, characterised in that there are cutting teeth around 270° of the circumference of the opening (27) through the dispensing part (21).

Patentansprüche

1. Vorrichtung zur Abgabe von fließendem Material durch eine flexible Wand eines Sackes, umfassend ein ringförmiges Verschlussteil (5) in dem Sack (1), und ein Abgabeteil (21) außerhalb des Sackes (1), welches auf das Verschlussteil (5) aufgesetzt werden kann, indem die Wand des Sackes durchtrennt wird, so daß eine durchgehende, gegen die Wand abgedichtete Verbindung entsteht, wobei das Verschlussteil (5) und das Abgabeteil (21) jeweils eine ringförmige Verschlussfläche (9, 11, 31) aufweisen, die eine Öffnung (19, 27) in dem Teil umgibt, wobei die Verschlussflächen (9, 11, 31) in schließenden Eingriff mit der zwischen ihnen befindlichen Wand des Sackes gebracht werden können, und eine Schneideinrichtung (33) auf dem Abgabeteil (21) in dem Bereich, wo es von der Verschlussfläche (31) umgeben ist, wobei die Schneideinrichtung (33) in die Öffnung in dem Verschlussteil (5) eingesetzt werden kann, so daß sie die Wand des Sackes (1) durchschneidet, wenn die Verschlussflächen (9, 11, 31) in schließenden Eingriff gebracht werden, dadurch gekennzeichnet, daß die Teile (5, 21) zusammenwirkende Verriegelungseinrichtungen (13, 15, 17, 35, 37) umfassen, die mindestens ein elastisches Element aufweisen, das mit der zwischen diesen befindlichen Wand des Sackes in Eingriff kommen kann und die Wand des Sackes (1) straff spannen kann, bevor die Schneideinrichtung (33) die Wand des Sackes durchschneidet, und wobei die zusammenwirkenden Verriegelungseinrichtungen (13, 15, 17, 35, 37) anschließend in eine Verriegelungsstellung (Fig. 4) einrasten können, um die Teile (5, 21) in dichtem und miteinander verbundenem Eingriff zu halten.
2. Abgabevorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Verriegelungseinrichtung eine Einkerbung (17) am Außenumfang des Verschlussteils (5) umfaßt und eine im wesentlichen konische Gleitfläche (13, 15), die zu der Einkerbung hinführt, und elastische



Schnappzungen (35) an dem Abgabeteil (21), die in die Einkerbung (17) passen.

3. Abgabevorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß das ringförmige Verschlussteil (5) auf beiden Seiten einer Mittelebene (7) eine Verschlussfläche (9, 11) umfaßt und eine im wesentlichen konische Gleitfläche (13, 15), die zu einer Einkerbung (17) in der Mittelebene hinführt.
4. Abgabevorrichtung nach Anspruch 2 oder 3, dadurch gekennzeichnet, daß die Schnappzungen (35) auf der Innenseite vorstehende freie Endbereiche aufweisen, die die Wand des Sackes kraftschlüssig festhalten sollen, damit die Wand des Sackes straff gespannt wird, bevor die Schneideinrichtung die Wand des Sackes durchschneidet.
5. Abgabevorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Schneideinrichtung (33) aus einer Vielzahl von Schneidzähnen besteht.
6. Abgabevorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß die Schneidzähne auf dem Umfang der Öffnung (27) in dem Abgabeteil (21) verteilt sind.
7. Abgabevorrichtung nach Anspruch 6, dadurch gekennzeichnet, daß Schneidzähne über einen Bereich von 270° des Umfangs der Öffnung (27) in dem Abgabeteil (21) verteilt sind.

Revendications

1. Dispositif pour distribuer un matériau fluide à travers une paroi flexible d'un sac, comprenant une partie de fermeture étanche annulaire (5) prévue dans le sac (1), et une partie de distribution (21) prévue à l'extérieur du sac, adaptée pour être mise en correspondance avec la partie de fermeture étanche (5) lorsque la paroi du sac est rompue et former une liaison continue en contact étanche avec la paroi, la partie de fermeture étanche (5) et la partie de distribution (21) comportant chacune une surface d'étanchéité annulaire (9, 11, 31) qui entoure une ouverture (19, 27) ménagée dans la partie de fermeture étanche, lesdites surfaces d'étanchéité (9, 11, 31) pouvant être amenées en contact étanche avec la paroi du sac entre elles, et des moyens de coupe (33) sont prévus sur la partie de distribution (21) dans la zone qui est entourée par sa surface d'étanchéité (31), lesdits moyens de coupe (33) étant adaptés pour être insérés dans ladite ouverture

de ladite partie de fermeture étanche (5), de façon à réaliser une coupe à travers la paroi du sac (1) lorsque les surfaces d'étanchéité (9, 11, 31) sont amenées en contact étanche, caractérisé en ce que les parties (5, 21) comprennent des moyens de verrouillage coopérant (13, 15, 17, 35, 37), comportant au moins un organe élastique, et adaptées pour amener la paroi du sac entre elles et étirer la paroi du sac sous forme tendue avant que les moyens de coupe (33) ne coupent la paroi du sac, les moyens de verrouillage coopérant (13, 15, 17, 35, 37) étant adaptés pour venir en conséquence dans une position de verrouillage (figure 4) et maintenir lesdites parties (5, 21) en contact étanche et en correspondance.

2. Dispositif de distribution selon la revendication 1, caractérisé en ce que les moyens de verrouillage comprennent une dépression d'encliquetage (17) ménagée à la périphérie externe de la partie de fermeture étanche (5) et une surface de glissement essentiellement conique (13, 15) conduisant à la dépression d'encliquetage, et des languettes d'encliquetage élastiques (35) qui sont prévues sur la partie de distribution (21) et qui correspondent à la dépression d'encliquetage (17).
3. Dispositif de distribution selon la revendication 2, caractérisé en ce que la partie de fermeture étanche annulaire (5) comprend de part et d'autre d'un plan central (7) une surface d'étanchéité (9, 11) et une surface de glissement essentiellement conique (13, 15) conduisant à une dépression d'encliquetage (17) ménagée dans le plan central.
4. Dispositif de distribution selon les revendications 2 ou 3, caractérisé en ce que les languettes d'encliquetage (35) comportent des zones d'extrémité libres se projetant vers l'intérieur et réalisées de manière à obtenir un entraînement par friction de la paroi de sac et étirer de façon tendue la paroi du sac avant que les moyens de coupe ne coupent la paroi du sac.
5. Dispositif de distribution selon la revendication 1, caractérisé en ce que les moyens de coupe (33) sont constitués par une pluralité de dents de coupe.
6. Dispositif de distribution selon la revendication 5, caractérisé en ce que les dents de coupe sont distribuées autour de la périphérie de l'ouverture (27) prévue dans la partie de distribution (21).



7. Dispositif de distribution selon la revendication 6, caractérisé ce que les dents de coupe sont distribuées suivant un angle de 270° sur la périphérie de l'ouverture (27) prévue dans la partie de distribution (21).

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