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(54) Title: CABLE WINDER

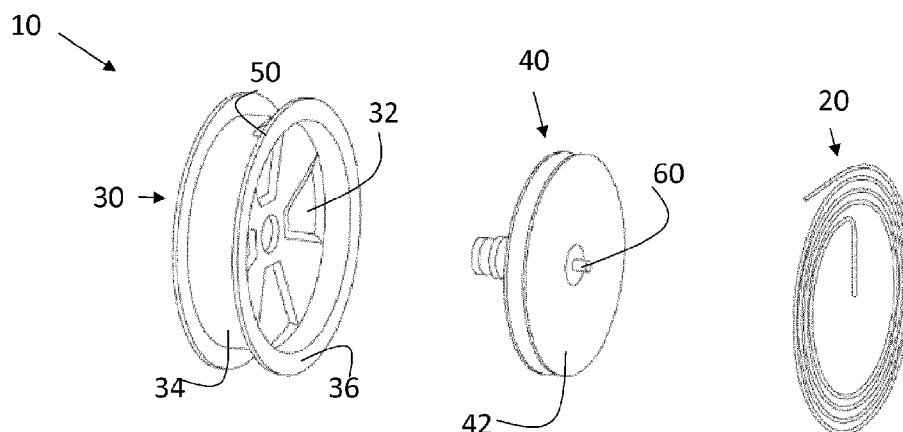


Fig. 5

(57) Abstract: A cable winder (10) having two drums on the cable winder is provided. One first drum (30) that feeds cable (20) from the cable finder and one second drum (40) that accommodates for the twisting of the cable when rolled onto/out from the first drum.



Cable Winder

Technical field

The invention relates to a cable winder.

Background

Electrical cables are used in many applications. For example, electrical cables are used to feed power and also data signals to different electrical devices. Some devices, such as electrical power tools are fed with both electrical power and electrical data signals via an electrical cable.

A problem encountered when operating an electrical device that is fed with an electrical cable is that the desired length of the electrical cable can vary from time to time. As a result the electrical cable will be tangled when the entire length of the cable is not used.

A way to solve the problem of tangled cables is to use a cable winder that is adapted to hold the electrical cable that is not used. For example US 9,079, 747 describes a container that accommodates a cable.

There is a constant desire to improve the operation of devices connected to an electrical cable. Hence, there exists a need for an improved cable winder and to devices including a cable winder.

Summary

It is an object of the invention is to provide an improved cable winder and to related devices.

This object is obtained by the cable winder and the balancer as set out in the appended claims.

As has been realized by the inventor, a problem with existing cable winders is that the cable needs to be divided into separate parts when feeding a cable via a cable winder. This is because the cable winder rotates and that the cable therefore is twisted when the cable is rolled onto and from the winder if the cable is provided in one piece from outside of the cable winder onto the cable winder, via the cable winder, and out from the cable winder.

In accordance with the present invention this problem is solved by having (at least) two drums on the cable winder. One first drum that feeds cable from the cable finder and one second drum that accommodates for the twisting of the cable when rolled onto/ out from the first drum.

In accordance with one embodiment a cable winder for an electrical cable is provided. The cable winder comprises an outer drum rotatable around a center axis and an inner drum also rotatable around the center axis. The cable winder has a first opening formed at an outer section of the inner drum forming a passage from the inner drum to the outer drum. By providing a cable winder having (at least) two drums, twisting at the center axis can be avoided when rolling in/out cable from the outer drum. The rotation of the cable is instead absorbed by the inner drum.

In accordance with one embodiment the cable winder comprises a second opening forming a passage from outside of the cable winder to the inside of the inner drum. Hereby a cable can be provided in one piece all the way from outside the cable winder via the inner drum, the first opening to the outer drum and onwards to be connected to a device. The second opening can advantageously be provided in the center of the inner drum. Thus, in accordance with one embodiment an electrical cable is provided in one piece from the outside of the cable winder via the second opening rolled onto

the inner drum, and via the first opening rolled onto the outer drum.

In accordance with one embodiment the cable winder further comprises a fastener for fastening the electrical cable at an inner section of the outer drum. Hereby it is obtained that the amount of cable on the inner and the outer drum is not changed since the cable is prevented from moving through the opening in the outer drum.

In accordance with one embodiment the inner drum is located inside the outer drum in a space formed in the outer drum. Hereby the dimensions of the cable winder can be reduced and kept small. In particular the inner drum can be completely fitted inside the outer drum.

In accordance with one embodiment the electrical cable is rolled onto the inner drum in a direction opposite to the direction in which the electrical cable is rolled onto the outer drum when rolled up on the outer drum. Hereby it is obtained that the amount of cable that needs to be fitted onto the inner drum can be reduced and still allow for the same amount of cable to be rolled out from the outer drum without twisting the cable at the center axis.

In accordance with one embodiment the width of the inner drum corresponds to the width of the electrical cable. Hereby it is obtained that the cable on the inner drum is not tangled.

In accordance with one embodiment a balancer is provided comprising a cable winder as described herein. By providing balancer with such a cable winder a number of advantages are obtained. For example a number of components can be removed from the work area where an operator operates a device that is held by a balancer and which device also requires a cable connection. One

such exemplary device is a power tool that for example can be used in an assembly line.

Brief description of the drawings

The invention will now be described in more detail and with reference to the accompanying drawings, in which:

- Fig. 1 shows a cable winder from the side with the cable in a position unwound from the cable winder,
- Fig. 2 shows a cable winder from the side with the cable in a position retracted and wound onto the cable winder,
- Fig. 3, is a view showing the cable winder in perspective with the cable in a retracted position,
- Fig. 4 shows a cable winder in perspective with the cable in a position unwound from the cable winder,
- Fig. 5 is an exploded view of a cable winder, and
- Fig. 6 is a view of a balancer with a cable winder.

Detailed description

There is a vast number of electrical devices that uses electrical power or electrical signals provided via a cable. By way of example only, an electrical power tool is contemplated as the electrical device in the following description of exemplary embodiments. While the cable winder and related devices as described herein advantageously can be used together with an electric power tool, there is no limitation as to the electrical device to be connected to the winder as described herein. The cable winder can be used together with any electrical device.

In Fig. 1, a cable winder 10 is depicted. In Fig. 1 the cable winder 10 is shown with a cable 20 in a position unwound from the cable winder 10. The cable winder comprises an outer drum 30 and an inner drum 40. The inner drum 40 is in connection with the outer drum 30 such that the cable 20 can be passed from the inner drum 40 to the outer drum 30 in one piece, i.e. without any electrical connections. For example an opening 50 can be provided between the inner drum 40 and the outer drum 30. The drum opening 50 can typically be provided in an outer section of the inner drum 40 and an inner section of the outer drum 30. The outer drum 30 and the inner drum 40 advantageously rotate around a common axis.

Further, the inner drum 40 can be provided with an opening 60. The opening 60 provides a passage from outside the cable winder 10 to the inner drum 40. Hereby a cable 20 can be passed from the outside of the cable winder 10 onto the inner drum 40 in one piece without having to provide any electrical connections on the cable 20. The inner drum opening 60 can advantageously be provided in the center of the inner drum 40 or close to the center of the inner drum 40. The cable 20 can be passed through the inner drum opening 60. Hence, the cable 20 can be passed in one piece from the outside of the cable winder 10 through the inner drum opening 60 onto the inner drum 40 and through the opening 50 onto the outer drum 30. Hereby it is possible to provide a cable from outside onto the winder 10 and out from the winder 10 without any electrical connections.

The cable 20 can in accordance with some embodiments be fastened to the outer drum 30 by a fastener. The fastener can generally be located at an inner section of the outer drum 40. In accordance with some embodiments the fastener is positioned at the opening 50 or at a location close to the opening 50. Hereby it is achieved that when the cable is rolled out from the cable winder 10 there is a stop preventing more cable from being rolled out from the cable winder 10 when all (or close to all) cable 20 of the outer

drum 30 is rolled out from the cable winder 10. The fastener can be any suitable fastener such as glue or a strain relief.

In Fig. 2, the cable winder 10 with the cable 20 in a retracted position and completely wound onto the cable winder is shown. As can be seen in Fig. 2 when the winder 10 is rolled up, the cable on the inner drum 40 will distance from the center of the inner drum 40 and thereby make it possible to roll up the cable on the outer drum 30 without twisting the cable 20 at the opening in the inner drum 40.

The cable 20 that can be rolled onto the cable winder 10 can be any type of electrical cable. For example, the cable 10 can be a power supply cable or a signal cable. The cable 20 can have any dimensions and a cross section having any shape. In accordance with one embodiment the cross section of the cable 20 is generally flat. In accordance with one embodiment, the generally flat shape is provided by forming a cable from two electrical wires placed side by side. The electrical wires placed side by side can be one wire for signals such as data signals and one wire for power. In accordance with one embodiment the cable can also be provided with a re-enforcement member to make the cable stronger. When the cable comprises two wires the re-enforcement member can be located in-between the two wires.

In Fig. 3, a view showing the cable winder in perspective with the cable in a retracted position is shown. As can be seen in Fig. 3, the inner drum 40 can advantageously be coaxial with the outer drum 30. Further, in accordance with one embodiment the inner drum 40 can be located completely inside the outer drum 30. Also the opening 60 can be seen located in the center of the inner drum with the cable 20 extending all the way from the opening 60 via the inner drum 40 onto the outer drum 30 from which outer drum 30 the cable 20 can be rolled out.

Fig. 4 is similar to Fig. 3 and shows the cable winder 10 in perspective with the cable 20 in a position unwound from the cable winder 10. As can be seen in Fig. 4 when compared to Fig. 3, as the cable unwinds from the outer drum 30 the rotation of the coaxial drums 30 and 40, will cause the cable on the inner drum 40 to wind up closer to the center of the inner drum 40. In accordance with one embodiment the dimensions of the inner drum 40 is designed to match the width of the cable 20. Hereby it is obtained that the risk that the cable on the inner drum 40 gets tangled is reduced or even eliminated. For example the width of the inner drum can correspond to the width of the cable 20. In accordance with some embodiments the width of the inner drum 40 is designed to be in the interval of between 1 to 2 times the width of the cable 20. By allowing for the cable on the inner drum 40 to change position in relation to the center of the inner drum 40, the cable from the outer drum can be rolled in and out from the cable winder 10 without twisting the cable 20 at the opening 60. Further, as is realized, the lengths of the cable 20 that can be rolled out from the outer drum 30 will depend on the dimensions of the inner drum and the amount of cable 20 on the inner drum 40. A larger inner drum 40 combined with a sufficient lengths of the cable on the inner drum will enable a longer bit of cable 20 to be rolled out from the outer drum 30. When all cable 20 on the inner drum 40 is tightly wound around the center of the inner drum, no more cable can be pulled from the outer drum 30 without twisting the cable 20 at the opening 60. Similarly when all cable 20 on the inner drum is pushed all the way out to the outer perimeter of the inner drum 40, no more cable can be wound onto the outer drum 30 without twisting the cable 20 at the opening 60.

The cable 20 can be wound onto the inner drum 40 in the same direction as the cable is wound onto the outer drum 30. However, in accordance with one embodiment the cable 20 is rolled onto the inner drum 40 in an opposite direction than the cable on the outer

drum when in a position rolled onto the outer drum 30. Hereby it is achieved that more cable can be rolled out from the outer drum 30 with the same dimensions of the inner drum 40. This is because the cable 20 on the inner drum 40 will then first move outwards on the inner drum and reach an outer position and then reverse before reaching the end position depicted in Fig. 4.

Fig. 5 is an exploded view of a cable winder 10. Fig. 5 shows the outer drum 30, the inner drum 40 and the cable 20. The outer drum 30 can be provided with a space 32 in which the inner drum 40 fits. The outer drum 30 further comprises an opening 50 in its bottom section 34 for receiving the cable from the inner drum 40. The outer drum 30 can further comprise sides 36 fixed onto the bottom section 34 for laterally keeping the cable 20 on the outer drum when the cable 20 is rolled onto the outer drum 30.

The inner drum 40 can thus in accordance with some embodiments be fitted inside the outer drum 30 in the space 32 formed in the outer drum 30. The inner drum 40 can further comprise sides 42 fixed onto a center section of the inner drum 40 for laterally keeping the cable 20 on the inner drum 40 when the cable 20 is rolled in and out on the outer drum 30 and when the cable 20 will move in a direction perpendicular to the rotational axis of the cable winder 10. The inner drum 40 also comprises the opening 60 for receiving the cable 20 from outside of the cable winder 10.

The cable winder in accordance with the above can advantageously be made a part of a balancer. In such a configuration a tool, such as a power tool can be connected via the balancer which then serves both as a cable winder and a balancer thereby creating a good work environment, for example in an assembly factory, where an operator will get rid of tangled cable and at the same time can have the tool easy to use with aid of the balancer.

In Fig. 6 a view of a balancer 80 with a cable winder as described herein is shown. The balancer 80 is adapted to hold a power tool

60. The power tool is fed with power and /or signals via a cable 20. The cable 20 can be connected in one piece from outside of the balancer 80, via the cable winder located in the balancer 80 and connected in the other end to the power tool. The power tool 60 is held by the balancer 80 via a wire 62 that mechanically holds the power tool in a desired position in a conventional manner. When the position of the power tool is changed, the length of the cable 20 between the power tool 60 and the balancer 80 can be adjusted by the cable winder of the balancer 80. Hereby it is avoided that the cable 20 is tangled when the power is in a position where not the entire length of the cable 20 is used. The cable 20 will not have any electrical connections, which ensures that power and signals are delivered in an efficient manner to the power tool 60.

Claims

1. A cable winder (10) for an electrical cable (20), the cable winder (10) comprising an outer drum (30) rotatable around a center axis characterized by an inner drum (40) rotatable around said center axis and having a first opening (50) forming a passage from the inner drum (40) to the outer drum (30).
2. The cable winder (10) according to claim 1, further comprising a second opening (60) forming a passage from outside of the cable winder (10) to the inside of the inner drum (40).
3. The cable winder (10) according to claim 2, wherein the second opening (60) is provided in the center of the inner drum (40).
4. The cable winder (10) according to anyone of claims 1 - 3, further comprising a fastener for fastening the electrical cable (20) at an inner section (34) of the outer drum (30).
5. The cable winder (10) according to anyone of claims 1 - 4, wherein the inner drum (40) is located inside the outer drum (30) in a space (32) formed in the outer drum (30).
6. The cable winder (10) according to claim 5, wherein the inner drum (40) is completely fitted inside the outer drum (30).

7. The cable winder (10) according to anyone of claims 1 - 6, further comprising an electrical cable (20) provided in one piece from the outside of the cable winder (10) via the second opening (60), rolled onto the inner drum (40), and via the first opening (50) rolled onto the outer drum (30).

8. The cable winder (10) according to claim 7, wherein the electrical cable (20) is rolled onto the inner drum (40) in a direction opposite to the direction in which the electrical cable (20) is rolled onto the outer drum (30) when rolled up on the outer drum (30).

9. The cable winder (10) according to anyone of claims 1 - 8, wherein the width of the inner drum (40) corresponds to the width of the electrical cable (20).

10. A balancer (80) comprising a cable winder in accordance with anyone of claims 1 - 9.

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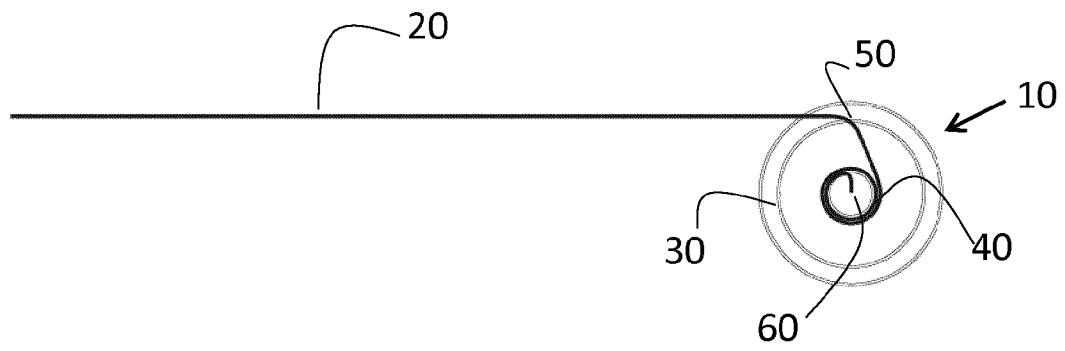


Fig. 1

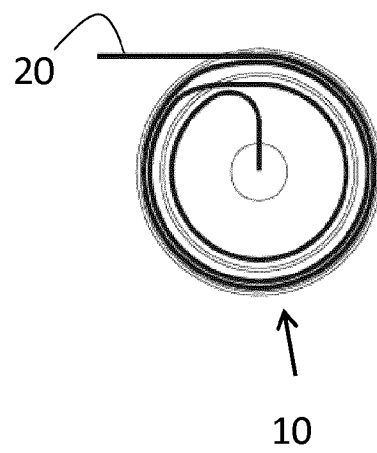


Fig. 2

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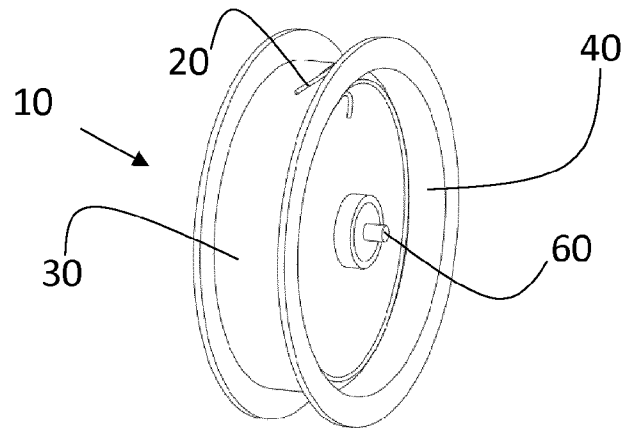


Fig. 3

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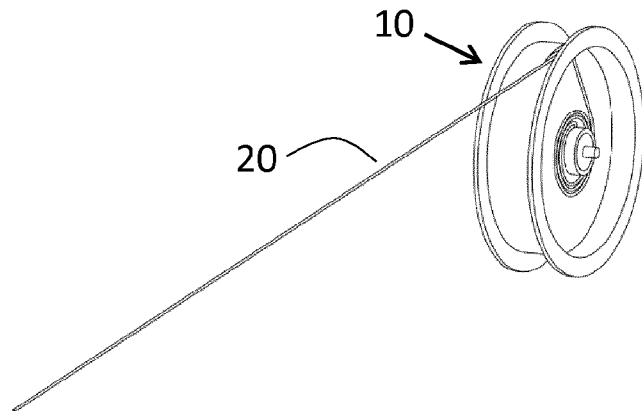


Fig. 4

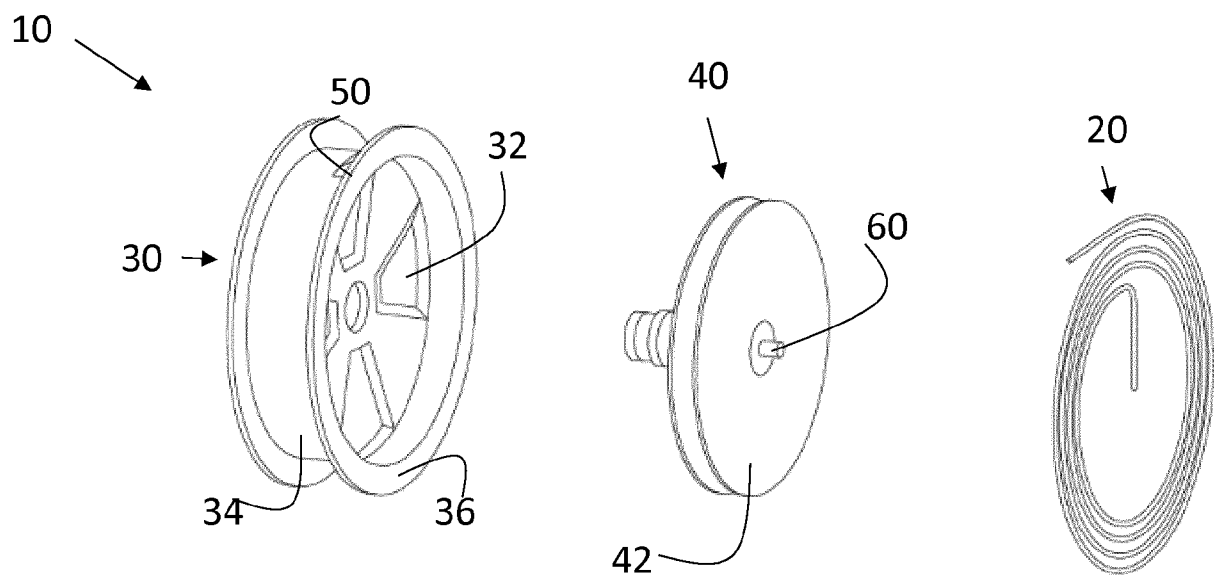
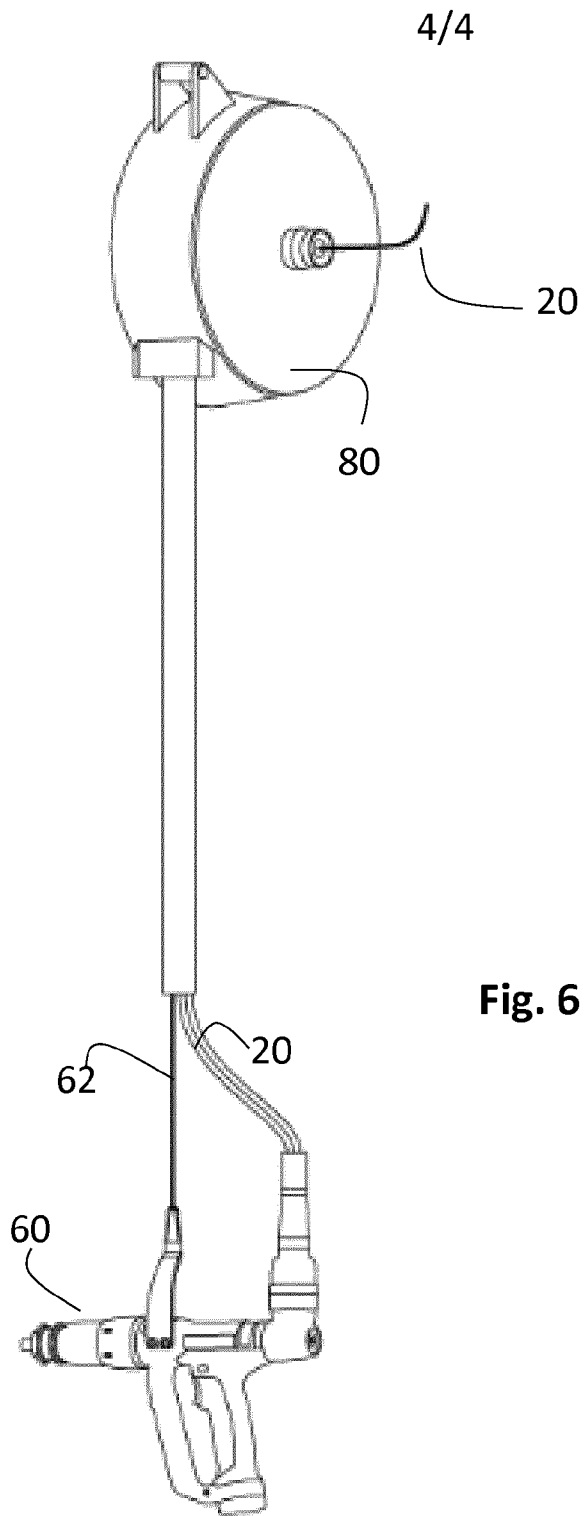


Fig. 5



INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER

INV. B65H75/44

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 549 308 A1 (CEMREP [FR]) 18 January 1985 (1985-01-18) page 1, line 1 - line 5 page 1, line 14 - line 17 page 1, line 22 - line 28 page 2, line 1 - line 11 page 2, line 33 - page 3, line 15 figures 1-2 -----	1-10
X	FR 2 041 352 A5 (CHEMAILLE SA) 29 January 1971 (1971-01-29) page 1, line 21 - line 25 page 1, line 32 - page 2, line 27 figure 1 -----	1-10
X	US 3 409 246 A (DE PAS LADDIE A) 5 November 1968 (1968-11-05) column 2, line 21 - line 65 figures 2,3 -----	1-3,5-10



Further documents are listed in the continuation of Box C.



See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2549308	A1	18-01-1985	NONE
FR 2041352	A5	29-01-1971	NONE
US 3409246	A	05-11-1968	NONE