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(54) **Title:** ASSEMBLED POLE PART WITH POLE PART FRAME

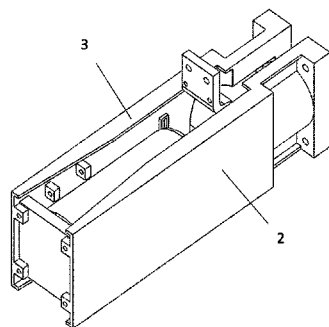
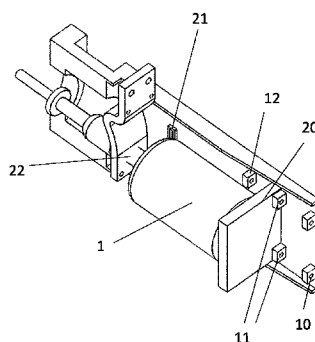


Figure 1



(57) **Abstract:** The invention relates to an assembled pole part with two pole part frames (2, 3) made of insulating material, between which a vacuum interrupter (1) is mounted, and that the vacuum interrupter is applied with a fixed contact and a moving contact, so that at one end of the frame is applied with a support (21) in order to fix the vacuum interrupter at the moving contact side, and fixation means (10, 11, 12) for the fixed contact side at the other end of the frame. In order to apply common pole part frames for different vacuum interrupter sizes, the invention is, that at least two fixation means or fixation points (10, 11, 12) are arranged pairwise in parallel along different distances to each along the long axis of the frame, wherein the second support is the fixation means for the fixed contact side of the vacuum interrupter, in order to be able to use one uniform constructed frame design for different vacuum interrupter lengths, in that way, that independent of the used vacuum interrupter length, the moving contact fixation support keeps at the same fixation position (21). Alternatively, support plates (20) of different thicknesses may be used.



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Assembled pole part with pole part frame

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The invention relates to an assembled pole part with two pole part frames made of insulating material, between which a vacuum interrupter is mounted, and that the vacuum interrupter is applied with a fixed contact and a moving contact, so that at one end of the frame is applied with a first support in order to fix the vacuum interrupter at the moving contact side, and fixation means for the fixed contact side at the other end of the frame, according to preamble of claim 1.

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An assembled pole part like that is disclosed in the EP 0 763 248 B1. The insulating frame parts are made of plastic. The vacuum interrupter is fixed via fastening elements which are implemented in the frame parts at definite fixation points.

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By this construction the frame parts are applied for definite vacuum interrupter size. After the fixation of the vacuum interrupter on the first frame part, the second frame part is fixed from the other side, so that the vacuum interrupter is fixed between both frame parts.

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Assembled pole parts like that are used in switching devices, particularly in gas filled switching devices.

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A disadvantage for this known construction is, that the frame parts are applied only to one vacuum-interrupter size.

So it is an object of the invention, to apply common pole part frames for different vacuum interrupter sizes, in order to alleviate the manufacture of such pole parts.

This is realized by, that at least two fixation means or fixation points are arranged pairwise in parallel along different distances to each along the long axis of the frame, wherein the second support is the fixation means for the fixed contact side of the vacuum interrupter, in order be able to use one uniform constructed frame design for different vacuum interrupter lengths, in that way, that independent of the used vacuum interrupter length, the moving contact fixation support keeps at the same fixation position.

Alternatively, but with the same technical effect, a pair of fixation points are arranged pairwise in parallel at one defined distance at the long axis of the frame, in order to be connected with the second support in that way, that the support is applicable with a distance adapter with choosable thickness, in order to be able to use one uniform constructed frame design for different vacuum interrupter lengths, in that way, that independent of the used vacuum interrupter length, the moving contact fixation support keeps at the same fixation position.

In the first alternative, the different length measures are considered by having several pairs of fixations points.

In the second alternative, the different length measures are considered by having only one pair of fixations points, but using additionally a support adapter with different thickness. Both results in the use of a uniformed construction for different possible lengths of vacuum interrupters.

A further advantageous embodiment is given by that at each fixation point a pair of fixation means are arranged in parallel at the same distance. By that the arrangement of two parallel frame parts result in four fixation points at each distance in order to fix there a plate. The dimensions of that plate refers to the diameter of the used vacuum interrupter.

Consequently to the use for different vacuum interrupter lengths it is advantageous, that at least two fixation points are implemented at two distances.

Furthermore, the fixation points on both frame parts are arranged like that at each fixation distance are arranged two fixations point in each frame part in that way, that in the mounted condition of the pole part, four fixation point at each defined distance are arranged.

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In context with that, it is advantageous, that at each fixation point or distance a plate can be fixed to the fixation means at each defined distance.

In a further embodiment, the fixation means are integrally formed in the frame parts.

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This is easy to manufacture in sense of a common construction type manufacture for different vacuum interrupter use.

Advantageous is also that guiding means for the movable contact stem of the vacuum interrupter are implementable between the two frame parts as well.

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The frame parts are made of insulating material, so that the vacuum interrupter of the completed assembled pole part is sandwiched between the insulating frame parts.

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Figure 1 shows an embodiment of the invention. The assembled pole part consist of a vacuum interrupter 1 which is arranged and will be finally fixed between two frame parts 2 and 3. At the right side of figure 1, the assembled pole part is open, or not completed, and shows the positioned vacuum interrupter 1. The fixed contact side of the vacuum interrupter is mounted on a metal plate 20, which is fixed at the fixation points 11. The fixations points 11 are integrally implemented in the frame parts.

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The vacuum interrupter 1 shown in this figure has such a length, that the plate 20 is mounted in the middle position of the possible 3 positions, implemented in that embodiment.

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Further fixation points 10 are implemented for longer vacuum interrupters and further fixation points 12 for shorter vacuum interrupters are also implemented. So this uniform frame design can be used for three different vacuum interrupter length dimensions. Further guiding means 21 for the movable contact stem 22 of the vacuum interrupter 1 is also implemented in the frame parts 2 and 3.

The left side of figure 1 shows the closed arrangement with two complementary designed frame parts 2 and 3, with a ready positioned vacuum interrupter between them. In result, the plate 20 is fixed in each frame part at the adjacent positions fixation points.

Such assembled pole parts are for medium voltage circuit breakers. The a.m. described pole parts are screwed to a base plate, not further shown, for all three pole-parts at the one side and a smaller metal-plate between the isolation-parts at the other side. The metal plate 20, as shown in figure 1, is screwed to the insulating frame parts 2 and 3, and the position of the metal plate 20 is applied to the length of the inserted vacuum interrupter 1.

At the other side of the vacuum interrupter, its movable contact is connected to a current-lamination and further to an operating stud, which is not shown in figure 1.

So because the frame of the pole part is made by two parallel insulating frame parts 2 and 3, the position of the metal plate 20 can be choosen, according to the length of the used vacuum interrupter 1.

Alternatively only one pair of fixations points is needed, if different support plates are used in different thickness, in order to consider different lenghts of possibly usable vacuum interrupters. The enormous advantage is, that also in this case only one uniform construction of frame parts 2 and 3 can be used for different vacuum interrupter lengths. Important is, that the frame parts 2 and 3 are identical, so that this is reducing the costs of manufacture.

In addition the distance between the parallel insulating frames can be varied with the diameter of the used vacuum interrupter, means for smaller diameter the width of the created pole is smaller, too. This gives a high grade of flexibility and allows a variancy of poles taking care of the used vacuum interrupter and the required pole distance.

So in result the function as well as the advantage of the invention is, that the basical construction and dimensions of the frame parts keep the same for use for different vacuum interrupter lengths and diameters.

Position numbers

	1	Vacuum interrupter
5	2	Frame part
	3	Frame part
	10	further fixation points
	11	fixation points
10	12	further fixation points
	20	metal plate
	21	further guiding means
	22	movable contact stem
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Claims

1. Assembled pole part with two pole part frames made of insulating material, between which a vacuum-interrupter is mounted, and that the vacuum
5 interrupter is applied with a fixed contact and a moving contact, so that at one end of the frame is applied with a first support in order to fix the vacuum interrupter at the moving contact side, and fixation means for the fixed contact side at the other end of the frame,
characterized in
10 that at least two fixation means or fixation points are arranged pairwise in parallel along different distances to each along the long axis of the frame, wherein the second support is the fixation means for the fixed contact side of the vacuum interrupter, in order be able to use one uniform constructed frame design for different vacuum interrupter lengths, in that way, that independent of
15 the used vacuum interrupter length, the moving contact fixation support keeps at the same fixation position.
2. Assembled pole part with two pole part frames made of insulating material, between which a vacuum-interrupter is mounted, and that the vacuum
20 interrupter is applied with a fixed contact and a moving contact, so that at one end of the frame is applied with a first support in order to fix the vacuum interrupter at the moving contact side, and fixation means for the fixed contact side at the other end of the frame, especially according to claim 1,
characterized in
25 that a pair of fixation points are arranged pairwise in parallel at one defined distance between each at the long axis of the frame, in order to be connected with the second support in that way, that the support is applicable with a distance adapter with choosable thickness, in order be able to use one uniform constructed frame design for different vacuum interrupter lengths, in that way,
30 that independent of the used vacuuminterrupter length, the moving contact fixation support keeps at the same fixation position.

3. Assembled pole part according to claim 1,
characterized in that at each fixation point a pair of fixation means are arranged in parallel at the same distance from the first support.
- 5 4. Assembled pole part according to claim 1,
characterized in that at least two fixation points are implemented at two distances from the first support.
- 10 5. Assembled pole part according to claim 1 or 2,
characterized in that the fixation points on both frame parts are arranged like that at each fixation distance are arranged two fixations point in each frame part in that way, that in the mounted condition of the pole part, four fixation point at each defined distance from the first support are arranged.
- 15 6. Assembled pole part according to claim 5,
characterized in that at each fixation point or distance from the first support a plate can be fixed to the fixation means at each defined distance.
- 20 7. Assembled pole part according to one of the aforesaid claims,
characterized in that the fixation means are integrally formed in the frame parts.
- 25 8. Assembled pole part according to one of the aforesaid claims,
characterized in that guiding means (21) for the movable contact stem (22) of the vacuum interrupter are implementable between the two frame parts (2, 3).
9. Assembled pole part according to one of the aforesaid claims,
characterized in that the frame parts (2, 3) are made of insulating material.
- 30 10. Assembled pole part according to one of the aforesaid claims,
characterized in that the frame parts (2, 3) will be positioned in parallel in a distance which can be chosen according to the diameter of the vacuum interrupter.

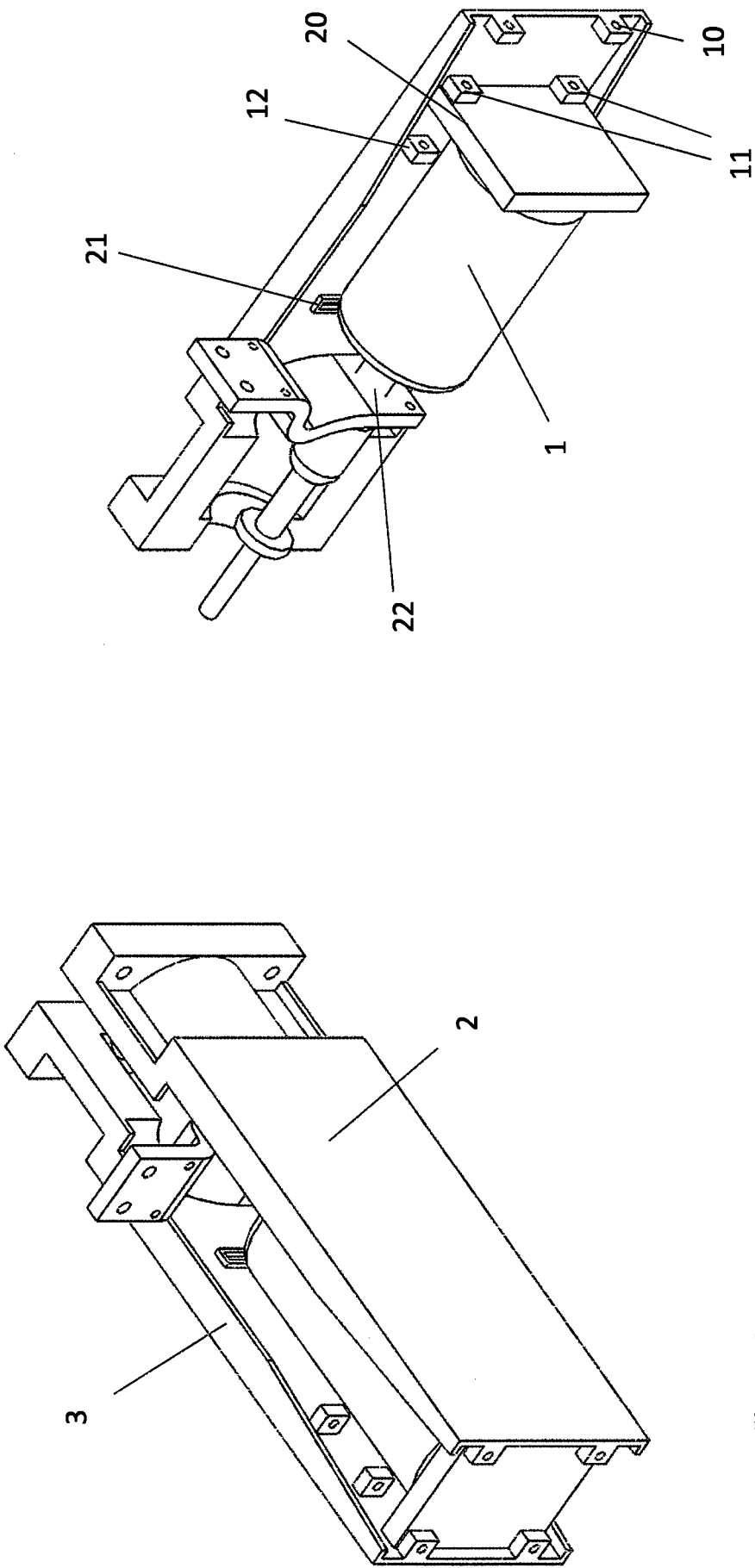


Figure 1

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2013/003081

A. CLASSIFICATION OF SUBJECT MATTER
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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)
H01H

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	DATABASE WPI Section EI, Week 199138 Thomson Scientific, London, GB; Class X13, AN 1991-279331 XP002693983, & SU 1 601 653 A1 (SKAZKO V A) 23 October 1990 (1990-10-23) abstract; figures 1-4	1-10
X	US 2001/025830 A1 (ALLARD HERVE [FR] ET AL) 4 October 2001 (2001-10-04) paragraph [0027] - paragraph [0032]; figures 1,2 ----- -/--	1-10



Further documents are listed in the continuation of Box C.



See patent family annex.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

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Name and mailing address of the ISA/

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Dobbs, Harvey

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2013/003081

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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