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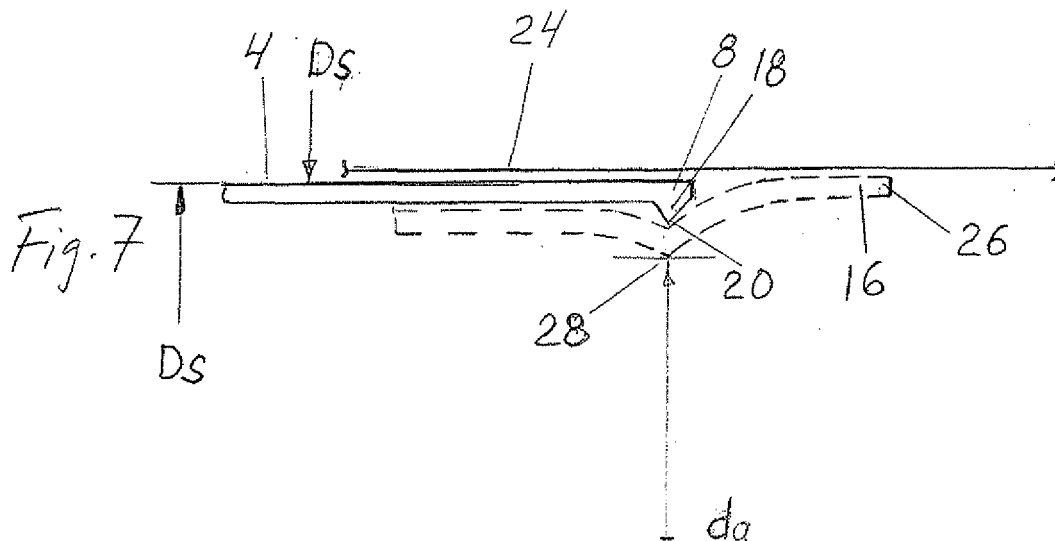
AL BA HR MK RS(71) Applicant: **SAAB AB****581 88 Linköping (SE)**

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• **Ax, Lars****146 54 Tullinge (SE)**• **Lantz, Eje****632 33 Eskilstuna (SE)**• **Norgren, Kent****691 48 Karlskoga (SE)**• **Pettersson, Rolf****644 36 Torshälla (SE)**(74) Representative: **Winblad, Hans Peter et al****Albihns Stockholm AB****Box 5581****114 85 Stockholm (SE)**(54) **Arrangement for weapon**

(57) The present invention relates to an arrangement (2) for a weapon comprising a counter mass for reducing the pressure around the weapon. The counter mass is enclosed in a container (10), which is mountable in the barrel (24) of the weapon behind an ammunition part, such as a projectile or shell. The container (10) is provided with an openable bottom (12) with break indications (14). A guiding folding support (6), configured as an annular element (8), is arranged adjacent to said openable

bottom (12) on the outside of the bottom relative to the counter mass container (10). The annular element (8) is provided with a support member (18) for each openable flap (16) forming part of the bottom (12). Thereby, the opening area a_1 in the bottom (12) of the counter mass container (10) is defined by folding edges (28), formed in each base region (22) of the flaps (16) in the open state as in contact with its corresponding support member (18).

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Description

BACKGROUND OF THE INVENTION

1. Technical field of the invention

[0001] The present invention relates to an arrangement for a weapon comprising a counter-mass for reducing the pressure around the weapon, the counter-mass being enclosed in a container, which is mountable in the barrel of the weapon behind an ammunition part, such as a projectile or shell, and comprising an openable cover with break indications on the ammunition part side and an openable bottom with break indications on the other side.

2. Description of related art

[0002] In order to increase the backward momentum and thus make possible an increase in weight of the ammunition part without excessively high pressure being created behind the weapon, it has been known for many years to introduce what is known as a counter-mass. A critical stage in weapons with counter-mass is the opening phase of the counter-mass container. In this connection reference might be made to our SE patents 0301626-8 and 0301627-6, which discloses examples of counter-mass containers with symmetrical opening of its cover, where all break indications contribute simultaneously to the opening operation. Variations in temperature and pressure of the weapon or the counter-mass container might, if not compensated, influence on the opening operation.

[0003] Likewise, it is important to obtain symmetrical opening of the bottom of the counter-mass container. In this regard it is vital that even all break indications of the bottom contribute simultaneously to the opening operation of the bottom. If any part of the bottom does not open at the same time as the other parts, an asymmetric flow is created when the counter-mass is leaving the counter-mass container, which can produce great shear forces on the barrel towards the outlet. For the good functioning of the weapon it is important that the counter-mass has a homogeneous form when it leaves the counter-mass container. Further, great recoil variations might occur within the temperature range. In case the bottom would fall apart into pieces, these would constitute a great risk behind the weapon.

[0004] Even the opening operation of the bottom depends on the temperature of the weapon or the counter-mass container. The operating temperature can vary between approximately -40°C and +63 °C. In order for the opening operation of the bottom to have as small a variation spread as possible and to create optimum opportunities for small recoil spreads, it is important to compensate for pressure variations.

SUMMARY OF THE INVENTION

[0005] One object of the present invention is to provide an arrangement for a weapon with a counter-mass container, which brings about an improved symmetrical opening operation with favourable recoil in a better way than before.

[0006] This is possible with an arrangement of the initially defined kind comprising a guiding folding support which is arranged adjacent to said openable bottom on the outside of the bottom relative to the counter-mass container.

[0007] Expedient improvements and developments of said arrangement appear from the appended claims and the following description.

[0008] According to an advantageous development of the arrangement the folding support is provided by means of an annular element configured to fit tightly against the outside of the counter-mass container and in agreement with the break indications of the openable bottom. The openable bottom is designed with a number of openable flaps and said annular element comprises a support member for each openable flap forming part of the bottom.

[0009] Introduction of the annular element with a support member for each openable flap enables the opening area in the bottom of the counter mass container be defined by folding edges formed by each base of the opened flaps as in contact with the corresponding support members.

[0010] This in turn results in as small a variation spread as possible in the opening operation of the bottom and the best opportunity for small recoil spreads has thus been created.

[0011] Further, it results in a reproducible, almost identical opening area, even if different weapons are utilized. Moreover, this makes it possible to restrict the generation of undesirable forces which might exert negative influence on the weapon, control the recoil progress and minimize the risk of an asymmetric pressurising of the counter-mass, each of which would affect the alignment of the weapon during the period when the shell is moving forward in the barrel. In addition, by varying the number of flaps and corresponding support members it is possible to control the opening area in the bottom of the container. Advantageously, each openable flap might be triangular and in the open state configured with free equilateral legs and a base region integral with the wall of the counter-mass container.

[0012] The invention will be described in more detail below by means of illustrative embodiments with reference to the accompanying schematic drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

Fig. 1 is a perspective view of a an arrangement for

a weapon with counter mass container in the form of a sleeve, in one end of which a guiding folding support is configured by means of an annular element, fig. 2 is a perspective view according to fig. 1 of a counter mass container with eight openable flaps mounted in the sleeve,

fig. 3 is an end view of fig. 1 showing the circumferential extension of the support members of the annular element,

fig. 4 is an end view of fig. 2 showing that a support member is allocated for each openable flap forming part of the bottom of the container,

fig. 5 shows a variant of fig. 4 of a counter mass container with four openable flaps mounted in the sleeve,

fig. 6 shows a longitudinal section of a rear part of a weapon provided with a counter mass container arrangement sectioned through lines $A_1 - A_1$; $A_2 - A_2$ as illustrated in fig. 4 and 5,

fig. 7 is a detailed section view on a larger scale of a bottom part of the container arrangement in fig. 6, which illustrates one flap in its open state after firing the ammunition.

DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0014] The general principles of an arrangement for a weapon comprising a counter mass container mentioned by way of introduction and particularly solutions to obtain symmetrical opening of the cover of the counter mass container are described in our SE patents 0301626-8 and 0301627-6 and therefore not described in greater detail here. The subject matter of the present invention is related to the opening of the bottom section of the counter mass container.

[0015] Fig. 1 is a perspective view of an arrangement 2 for a weapon with counter mass container comprising a sleeve 4, in one end of which a guiding folding support 6 is configured by means of an annular element 8. In this embodiment said sleeve 4 is configured as a lining or casing for the counter mass container, which is mountable in the sleeve 4.

[0016] Fig. 2 is a perspective view of the sleeve in fig. 1, in which a counter mass container 10 of a conventional kind is mounted. In this embodiment said container is configured with an openable bottom 12 by means of eight evenly distributed brake indications 14. In this way eight openable flaps 16 are defined in said openable bottom.

[0017] Fig. 3 and 4 are end views of fig. 1 and 2 respectively. Fig. 3 illustrates the circumferential extension of the annular element 8 and particularly it illustrates an assembly of eight separate support members 18 integrated in the annular element. One support member 18 is allocated for each openable flap 16 forming part of the bottom 12 of the container. Further, it is evident that each support member 18 is configured with a straight folding line 20, which constitutes a chord of the annular element

8 and is located at a distance d_1 from the centre line c. On the contrary to an arced folding line, which conventionally would appear in the bottom of a container in lack of the guiding folding support 6, said straight folding line 20 will prevent the appearance of tear-off edges in a base region 22 of each flap 16 integral with the wall of the counter mass container 10. This is essential as the absence of tear-off edges will secure that no debris from parts of flaps will adhere to the counter mass when flowing out through the outlet of the barrel. The configuration with eight support members 18 will result in a relatively large opening area a_1 in the bottom 12 of the container. The larger the number of support members the larger is the area of the opening in the bottom.

[0018] Fig. 5 shows a variant of fig. 4 having a counter mass container with four openable flaps mounted in the sleeve. In this embodiment said container is configured with an openable bottom by means of four evenly distributed brake indications 14'. In this way four openable flaps 16' are defined in said openable bottom. Fig. 5 illustrates the circumferential extension of the annular element 8' and particularly it illustrates an assembly of four separate support members 18' integrated in the annular element. One support member 18' is allocated for each openable flap 16' forming part of the bottom 12' of the container.

[0019] Even in this embodiment each support member 18' is configured with a straight folding line 20', which constitutes a chord of the annular element 8' and is located at a distance d_2 from the centre line c. The configuration with four support members 18' will result in a relatively small opening area a_2 in the bottom 12' of the container. The smaller the number of support members the smaller is the area of the opening in the bottom. With regard to the risk for appearance of tear-off edges in lack of guiding folding support, similar advantages are achieved as in the embodiment with eight openable flaps as illustrated in fig. 4. The fact is that such a small number as four openable flaps 16' even implies a greater risk, as each folding line 20' is proportionately longer and thereby more sensitive to be broken in pieces than in the embodiment with eight flaps.

[0020] Fig. 6 illustrates the rear part of a weapon comprising a barrel 24 accommodating an ammunition part with a projectile, shell or the like (not shown) and the counter mass container arrangement 2 sectioned through lines $A_1 - A_1$; $A_2 - A_2$. It is evident that the annular element 8 is configured at one end (the rear end) of the sleeve 4, which is arranged to interact between the counter mass container 10 and the barrel 24. In addition, the counter mass container 10 is mounted in the sleeve 4 with each support member 18 of the annular element located close to the corresponding base region 22 of each flap 16 in the openable bottom 12, which base region is integral with the wall of the counter mass container 10.

[0021] Fig. 7 is a detailed section view on a larger scale of a representative bottom part of the container arrangement in fig. 6, which illustrates in dashed lines one flap 16 in its open state. The sleeve 4 including the appropri-

ate support member 18 integrated in the annular element 8 has an outer diameter DS and is supported by the barrel 24. When firing the ammunition said flap 16 has been bent open to its open state by influence of the counter mass. It appears that the flap 16 has been bent over the support member 18 and the material of the flap in a hinge part in abutment against the support member 18 has been deformed to such an extent that its free end 26 is located close to the barrel 24, whereby a folding edge 28 is formed of said material in abutment against the support member.

[0022] Firstly, said folding edge 28 would be located a distance from the inside of the barrel 24, approximately the same as the outer diameter DS of the sleeve 4, which determines the actual location of the folding line 20, which in turn depends on the number of flaps chosen, compare distance d_1 in fig. 4 with distance d_2 in fig. 5 from the centre line c. Secondly, to d_1, d_2 or any optional such distance the thickness of the material in the flap should be added, which would result in a distance da from the centre line c. The actual distance da is the decisive design parameter for defining the opening area a_1, a_2 of the container. Hence, by varying the number of flaps it is achievable to control the opening area of the container. The described embodiments are disclosed with eight or four openable flaps only as non delimiting examples. Variants having different numbers of flaps are allowed within the scope of the invention.

[0023] Consequently, reproducible folding edges defining the opening area in the bottom of the container are formed in interaction between each opened flap and its corresponding support member.

Claims

1. Arrangement (2) for a weapon comprising a counter mass for reducing the pressure around the weapon, the counter mass being enclosed in a container (10), which is mountable in the barrel (24) of the weapon behind an ammunition part, such as a projectile or shell, and comprising an openable cover with break indications on the ammunition part side and an openable bottom (12) with break indications (14) on the other side, **characterized in that** a guiding folding support (6) is arranged adjacent to said openable bottom (12) on the outside of the bottom relative to the counter mass container (10).
2. Arrangement according to claim 1, **characterized in that** the guiding folding support (6) is provided by means of an annular element (8) configured to fit tightly against the outside of the counter mass container (10) and in agreement with the break indications (14) of the openable bottom (12).
3. Arrangement according to claim 2, **characterized in that** the openable bottom (12) is designed with a number of openable flaps (16) and that said annular element (8) comprises a support member (18) for each openable flap (16) forming part of the bottom (12).
4. Arrangement according to claim 3, **characterized in that** the openable bottom (12) is provided with at least four radially extended break indications (14) defining at least four openable flaps (16) for interaction with corresponding support members (18) of the annular element (8).
5. Arrangement according to one of claims 2-4, **characterized in that** the annular element (8) is configured at one end of a sleeve (4), which is arranged to interact between the counter mass container (10) and the barrel (24).
6. Arrangement according to one of claims 3-5, **characterized in that** each openable flap (16) is triangular and in the open state configured with free equilateral legs and a base region (22) integral with the wall of the counter mass container (10).
7. Arrangement according to claim 6, **characterized in that** the opening area (a_1) in the bottom of the counter mass container (10) is defined by folding edges (28), formed in each base region (22) of the flaps in the open state as in contact with its corresponding support member (18).
8. Arrangement according to one of claims 5-7, **characterized in that** the sleeve (4) is configured for modification of the barrel calibre.
9. Arrangement according to one of the preceding claims, **characterized in that** the sleeve (4) including the annular element (8) is made of a material having an ultimate breaking strength larger than that of the material of the barrel (24) at operating pressure.
10. Arrangement according to one of claims 3-9, **characterized in that** each support member (18) is configured with a straight folding line (20), which constitutes a chord of the annular element (8).

Fig. 1

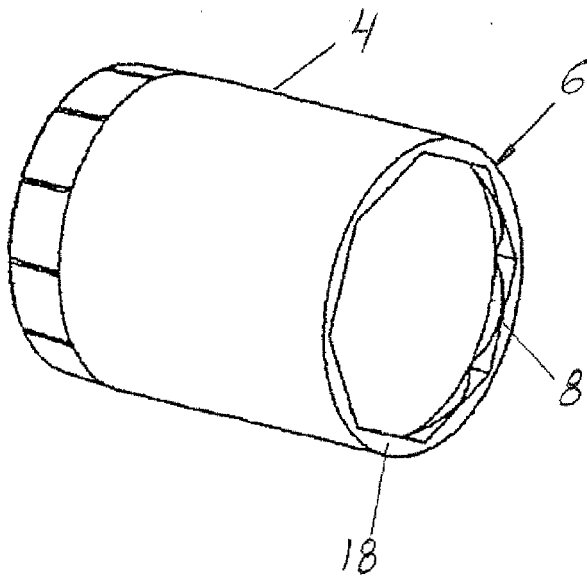
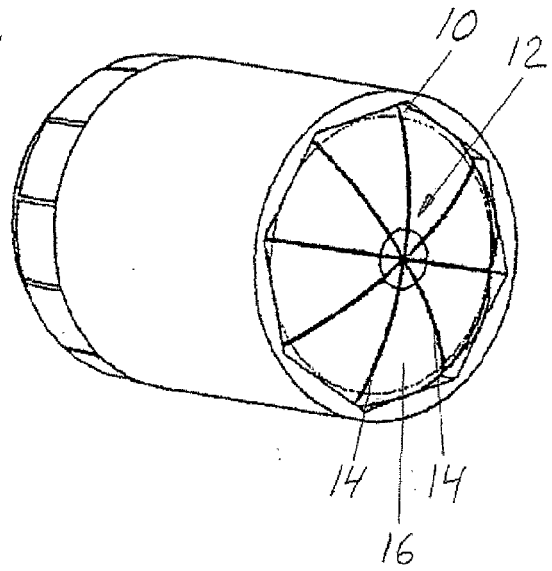


Fig. 2



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Fig. 4

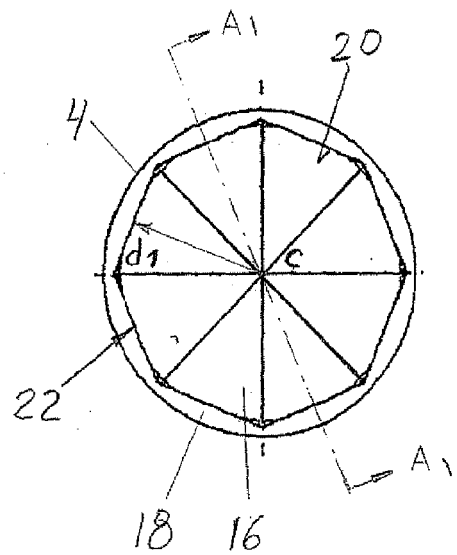
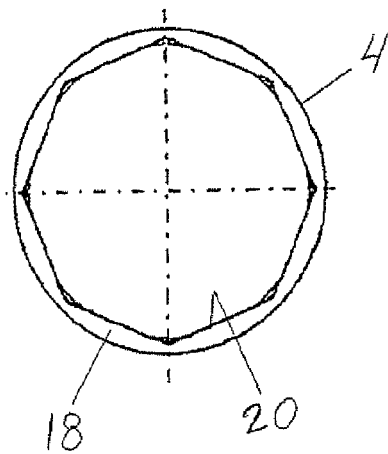
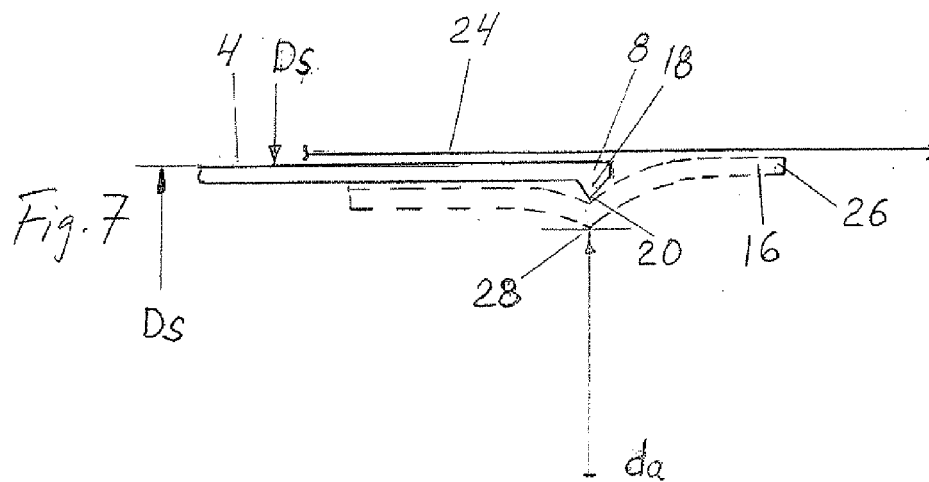
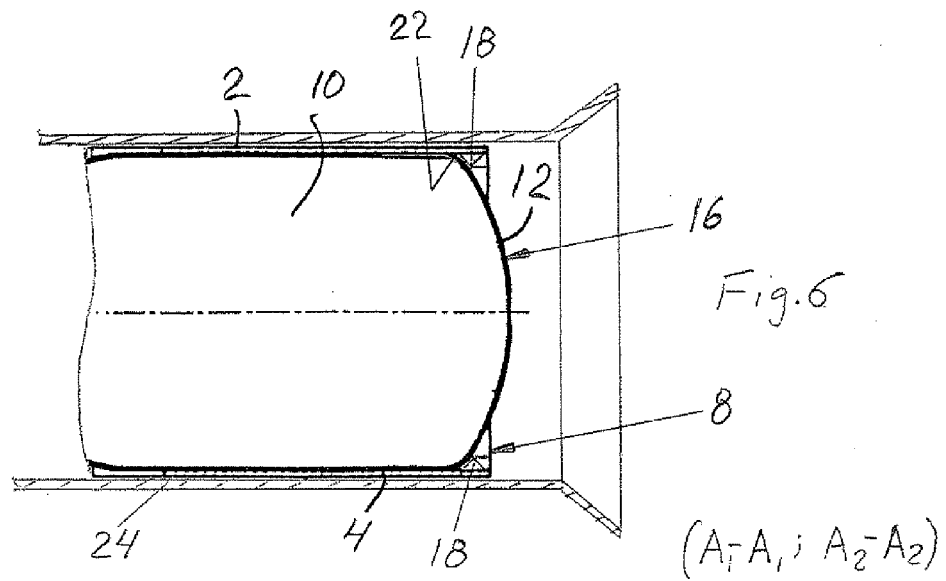
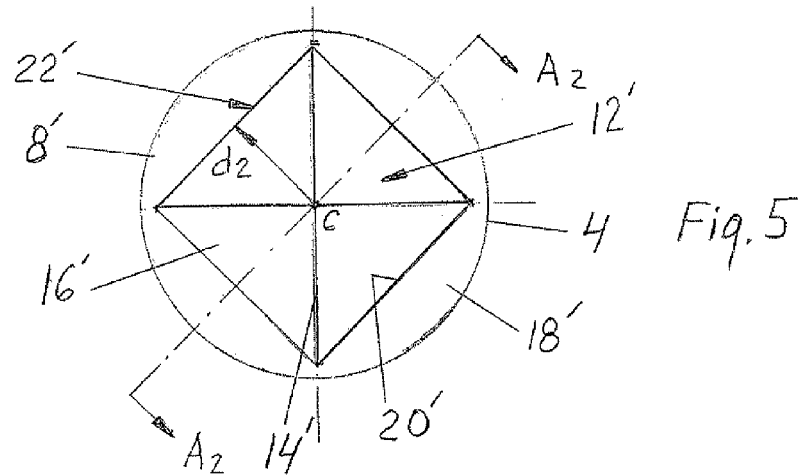


Fig. 3







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Application Number
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Place of search The Hague		Date of completion of the search 20 April 2007	Examiner GEX-COLLET, A
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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