(12) UK Patent Application (19) GB (11) 2 097 899 A

(21) Application No 8208262
(22) Date of filing 22 Mar 1982
(30) Priority data
(31) 3117801
(32) 6 May 1981
(33) Fed. Rep. of Germany (DE)
(43) Application published
10 Nov 1982
(51) INT CL³
F42B 4/00
(52) Domestic classification
F3A E1A5
F3C SB
(56) Documents cited
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(58) Field of search
F3A
F3C

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(54) Detonator strip for toy weapons

(57) In a detonator strip for toy weapons a plurality of holder bodies (10) containing an explosive substance (11) are arranged behind each other in a strip-like manner, wherein the respective distance between the centres of the holder bodies (10) is to be as small as possible. To advance them, each holder body is associated with at least one abutment face (18) at the firing position, wherein in addition to minimizing the distance between centres of the holder bodies (10) a torque-free transport of the detonator strip (13) is to be assured. For these reasons the abutment faces are formed by feed dogs (17) which are arranged at both sides of the detonator strip (13) perpendicularly to the longitudinal direction of the strip. A plurality of detonator strips can be arranged next to one another with the aid of wall parts (24) provided with breaking points (25).

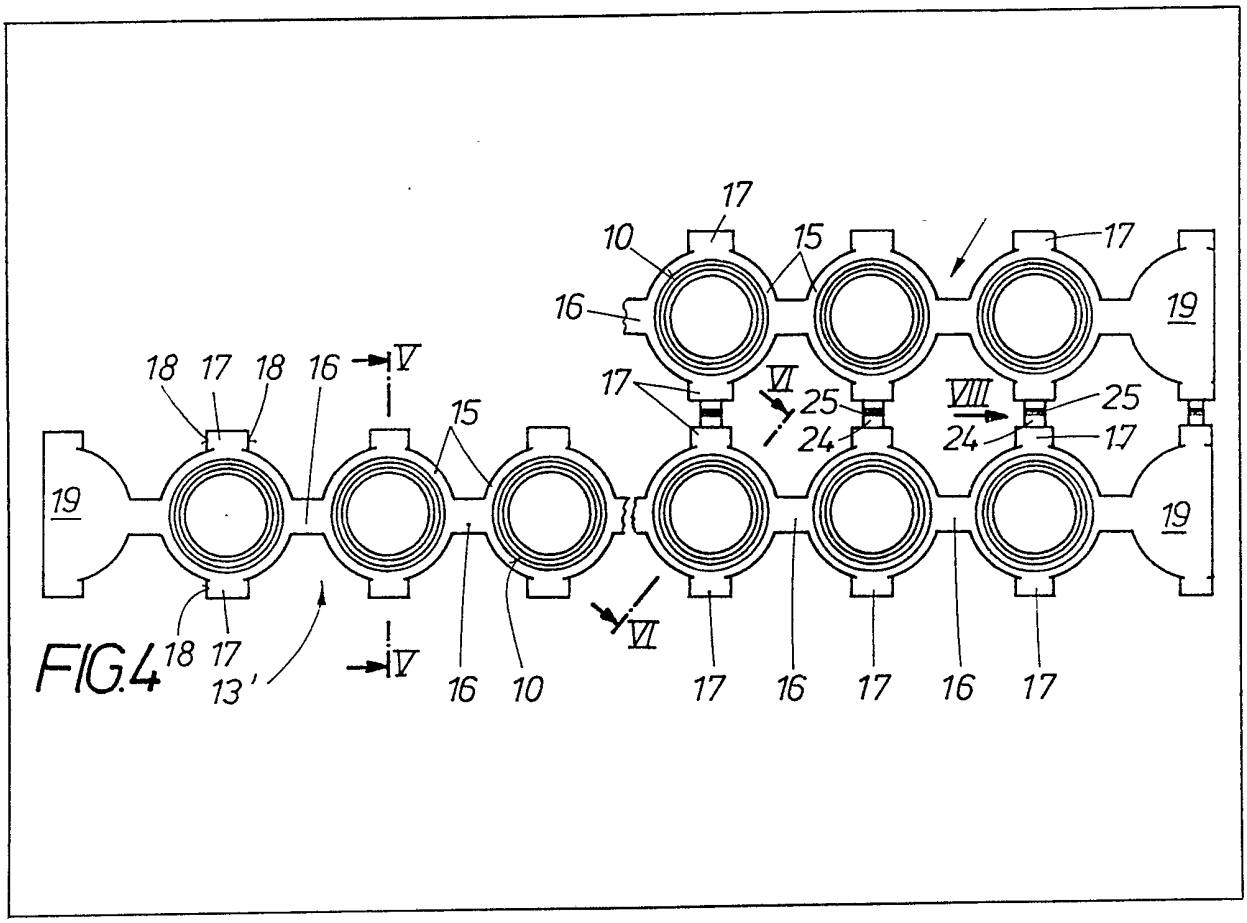

FIG.4

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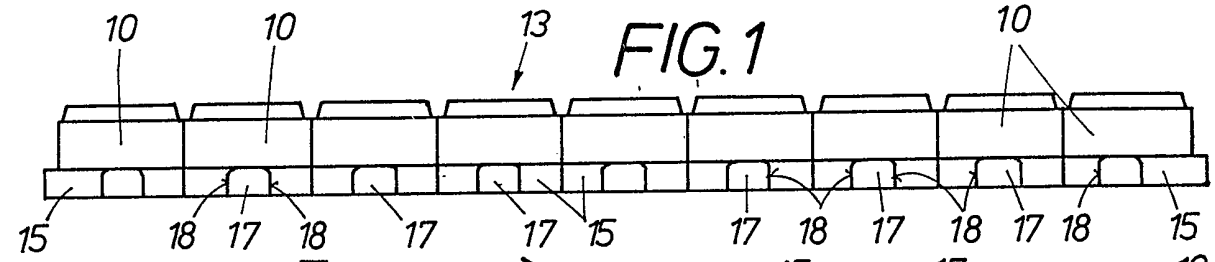

FIG.1

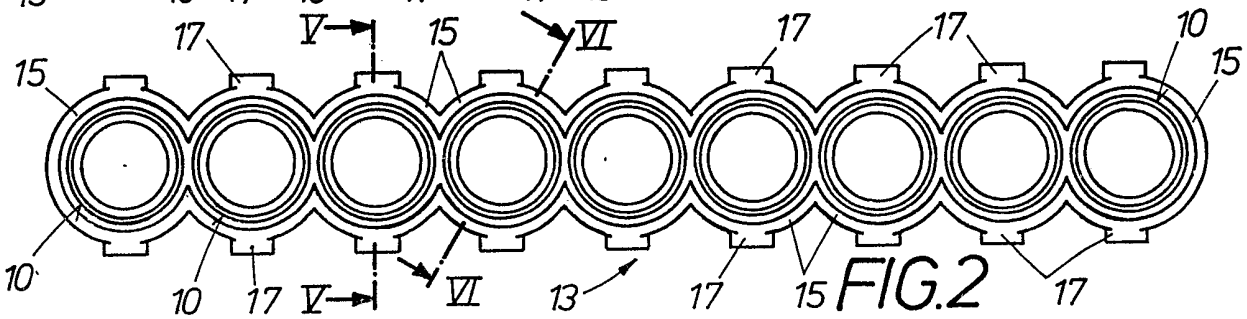

FIG.2

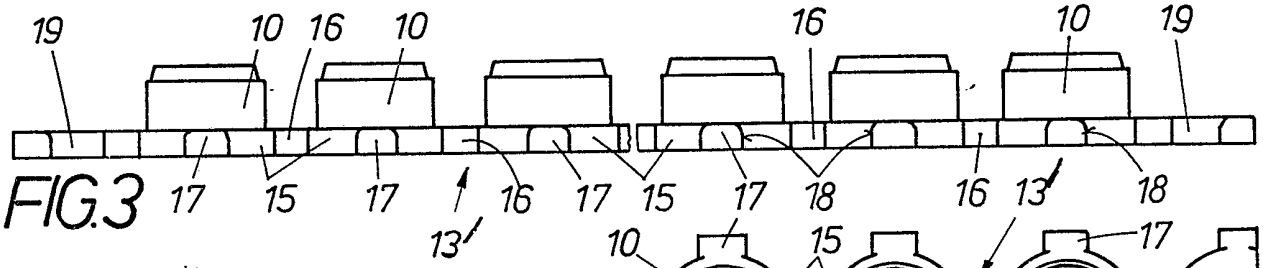

FIG.3

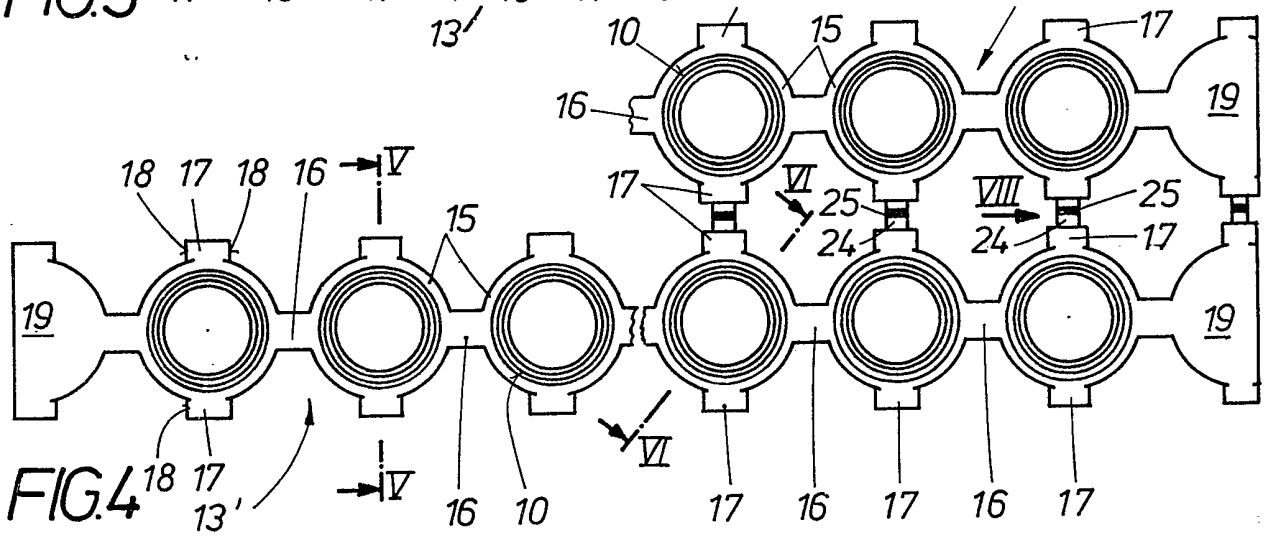

FIG.4

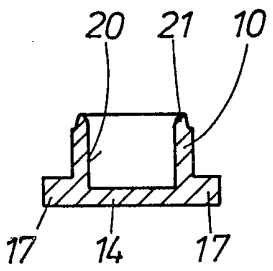

FIG.5

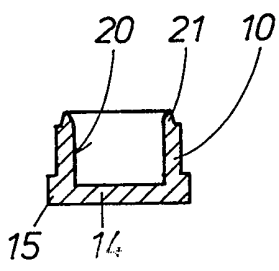

FIG.6

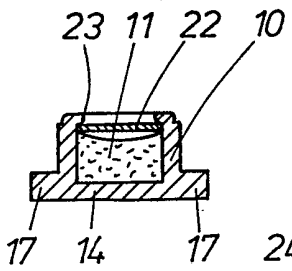

FIG.7

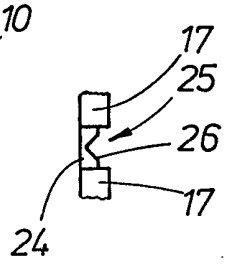

FIG.8

SPECIFICATION

Detonator strip for toy weapons

The invention concerns a detonator strip for toy weapons provided with a plurality of cup-shaped holder bodies for detonator charges serially arranged in a longitudinal direction wherein a stop or abutment face is assigned to each of the holder bodies for the purpose of transporting the detonator strip.

There are already known detonator strips for toy weapons are known wherein holder bodies arranged serially one behind the other are connected at a fixed distance from one another to a strip by means of connecting webs. To form a stop dog laterally projecting from the longitudinal centre line of the holder bodies arranged behind one another, these connecting webs are laterally offset in such a way that an abutment surface can be formed transversely of the direction of the strip. The transversal extension of the connecting webs and the spacing between the capsules is so dimensioned that after firing the detonator charge of a given holder body the latter may be severed from the rest of the detonator strip by an oblique cut. Such detonator strips are applied mainly in toy weapons provided with a firing means fitted with a cutting device which simultaneously effects ejection of the severed detonator capsule. A certain minimum distance between the individual holder bodies of the detonator charges has to be maintained to ensure trouble-free severing and ejection of the detonator capsules separated from the detonator strip after firing. Since there is only a certain amount of toy gun for accommodating the number of holder bodies incorporatable into the strip depends on the one hand on the dimensions of the individual holder bodies and on the other hand on the minimum gap between two consecutive holder bodies required for the severing. Since the stop face of this already known detonator strip is positioned outside the longitudinal centre line of the strip, a torque is generated on the strips as it is advanced. In order to avoid jamming of the detonator strip due to this torque, the strip has to be guided through the toy weapon precisely. In toy weapons where there is no provision for severing the already fired detonator capsules, too much space between consecutive holder bodies is wasted so that fewer firings per detonator strip are possible.

The task of the present invention is to provide a detonator strip for toy weapons, wherein the holder bodies of each detonator charge are serially arranged as closely behind one another as possible without causing jamming during the advance or feeding of the detonator strip.

This task is achieved according to the invention in that the stop or abutment face is formed from feed dogs or cams arranged at both longitudinal sides of the detonator strip contiguously to the holder bodies. In this way the detonator strip remains free from turning moments, because the force for advancing the detonator strip can act only at the longitudinal centreline due to the force exerted on the feed dogs or cams on both sides.

The two-sided arrangement of the feed dogs also renders gaps between the holder bodies unnecessary so that in an extreme case they may be seated very tightly next to one another such that the wall of a preceding holder body can go over into the wall of the following holder body. Thus each unit length of the detonator strip is maximally utilisable. It proved advantageous to surround the floor or base region of the holder body by a beaded edge from which the feed dogs or cams project diametrally oppositely and perpendicularly to the longitudinal direction of the detonator strip.

When, however, it is desired that the detonator strip strip should be flexible, e.g. to enable it to be advanced along a curvilinear guideway in the toy weapon, the holder bodies may, in a known manner be arranged at a distance from one another, wherein the webs connecting their beaded edges are arranged centrally in relation to the holder bodies and in the longitudinal direction of the detonator strip.

According to another embodiment of the invention for an economic manufacture of detonator strips it is proposed to form the inner wall of the cup-shaped holder body with a smooth finish and to provide the upper side of the holder body with an annular extension which is permanently deformable to seal a plate covering the explosive substance to an inwardly directed retainer rim. A further simplification of manufacture may be achieved when the ammunition consists of a plurality of juxtaposedly arranged detonator strips connected together by separable wall parts, wherein these wall parts connecting the detonator strips are preferably arranged between two mutually facing feed dogs and are provided with a preset breaking point. The preset breaking point in the connecting wall parts is preferably formed by a notch weakening the cross-section of the wall.

The invention is illustrated by way of preferred embodiments shown in the drawing, wherein:

Figure 1 shows a detonator strip in side view, wherein the holder bodies arranged serially and tightly close to one another;

Figure 2 shows the detonator strip illustrated in Figure 1 in plan view,

Figure 3 is a side view of another embodiment of the detonator strip, wherein the consecutive holder bodies are arranged serially and spaced apart,

Figure 4 is a plan view of the detonator strip shown in Figure 3, with another detonator strip paralllel with it, both detonator strips being integrally linked together by connecting wall parts,

Figure 5 shows a holder body of the detonator strip in section along the line V—V of Figures 2 and 4,

Figure 6 illustrates a holder body of the detonator strip in section along the line VI—VI of Figures 2 and 4,

Figure 7 shows the holder body illustrated in Figure 5 filled with an explosive charge and a

cover disc held by deformation of an annular extension, and

Figure 8 shows a connecting wall-part in side view in the direction of arrow VIII in Figure 4.

A predetermined number of cup-shaped holder bodies 10 illustrated in the drawing are arranged serially in tandem and together with the detonator charges 11 filled into the holder bodies 10 and the discs 22 covering the detonator charges 11 form detonator strips 13 and 13'. Each holder body 10 has an integrally formed base 14 which is surrounded by a beaded edge 15 the height may be slightly greater than the wall thickness of base 14 of each holder body 10. The holder bodies 10 may be produced of a thermoplastic material and formed into one-piece detonator strips by injection moulding. Deviating from the round cross-section of each holder body 10 shown in the drawing, the holder bodies may have other shapes, e.g. quadratic, rectangular, elliptical, or similar shapes. In the embodiment illustrated in Figures 1 and 2, the holder bodies 10 are so closely packed together in a row that their walls merge into one another in such a way that there is only a minimum of space between two adjacent holder bodies 10. This arrangement may be particularly favourable when the guide channel runs in a straight line in the toy gun.

A curvilinear track of the guide channel requires a more flexible detonator strip, to which end it may be advantageous if there is a spacing or gap between the individual holder bodies 10. In the embodiment illustrated in Figures 3 and 4 the holder bodies 10 are arranged serially and spaced apart and are connected together by webs 16 arranged centrally between two holder bodies 10.

Feed dogs or cams 17 project diametrally mutually oppositely and perpendicularly to the longitudinal direction of the detonator strip from the beaded edge 15 the side walls of which form abutment faces 18 for the advancing mechanism of the toy gun.

Irrespective of whether there are webs 16 between the holder bodies 10 or not, a transport plate 19 may be placed in front of the first holder body and behind the last holder body, the shape of which corresponds to one-half of the surface area of one holder body 10 surrounded by a beaded edge 15 and the feed dog 17, the wall thickness of the transport plate 19 being identical with the wall thickness of the web 16 and of the beaded edge 15. The transport plate 19 facilitates the advance of the detonator strip for firing the last detonator. The bilateral arrangement of the transport plate 19 permits the detonator strip to be used in both directions.

The one-piece detonator strips produced e.g. in an injection process are provided with cup-shaped holder bodies having smooth internal walls 20 continuing in an annular rim 21 at the upper end of the holder bodies 10. After the explosive substance 11 has been filled into the holder bodies 10 it is held therein sealed by a plate, the annular extension 21 being heat-deformed to form a retaining rim 23 engaging over the plate 22 in the region of the rim.

In the interests of economic production of detonator strips two or more individual strips can be juxtaposed and, in a single process, filled, covered and closed. To form such a strip unit, in the embodiment shown in Figure 4 two detonator strips are integrally joined together into a one-piece, in a respective wall part 24 connecting the mutually facing feed dogs 17 of the two detonator strips are provided with a rupture location 25. This rupture location 25 may be formed as is shown particularly in Figure 8, by a notch 26 weakening the thickness of the wall part 24. The detonator strips consisting of strip units formed in this way in order to facilitate their production can be separated either before forming them into packing bundles or by the end-user by tearing off so that single strips result that can be fed into the guide of the toy weapon. It is to be understood that the wall parts 24 of the detonator strips are shown on an approximately 5 times enlarged scale and are so dimensioned that they should fall within the range of tolerance of the guide track in the toy weapon and should not hinder the advance of the strip in the guide channel.

As already mentioned, the illustrated embodiments describe the invention purely by way of example but the invention is by no means restricted to them. Rather, many other embodiments and constructions of the invention are possible, e.g. the length of the detonator strip and thus also the number of holder bodies 10 may depend on the length of the guide channel in the toy gun. Also, the holder bodies 10 containing the explosive substance 11 could be sealed differently from the way described, wherein e.g. the free end of the inner wall 20 is provided with a groove into which the cover plate 22 may be inserted. Moreover, as distinct from the representation in Figure 4, more than merely two detonator strips may be connected integrally to each other. Furthermore, it is conceivable to arrange the feed dogs or cams 17 not as in the above-described and illustrated embodiment but at the region of the upper end of the holder bodies 10 or at any discretionally chosen point of their range of height, wherein the feed dogs or cams 17 need not necessarily be arranged at the same height as the beaded edge 15. Also, if need be, the beaded edge 15 may be wholly omitted. The sampe applies also to the webs 16 between the holder bodies 10, whose position in height may also be different from the height position of the feed cams 17 and the beaded edge 15.

CLAIMS

1. A detonator strip for toy weapons comprising a plurality of explosive charge holder bodies arranged in a longitudinal row behind one another each of the holder bodies being associated with an abutment surface for advancing the detonator strip, each abutment surface being formed as a feed dog arranged next to the associated holder

body at both longitudinal sides of the detonator strip.

2. A detonator strip according to claim 1, wherein a base part of each holder body is surrounded by a beaded edge from which the feed dogs project diametrally oppositely and perpendicularly to the longitudinal direction of the detonator strip.

3. A detonator strip according to claim 2 wherein the holder bodies are spaced apart in a per se known manner and their beaded edges have interconnecting webs which extend along the longitudinal direction of the detonator strip centrally to holder bodies.

4. A detonator strip according to any preceding claim wherein the internal surface of the wall of each holder body is smooth and its upper side is provided with an annular extension which is permanently deformable to seal an inwardly directed retaining rim to a plate covering the filling of explosive.

5. A combination of a plurality of detonator strips juxtaposed in a lattice-like arrangement and interconnected by separable wall parts, each strip being according to any of the preceding claims, wherein the wall parts connecting the detonator strips are arranged between two feed dogs facing each other and are provided with a desired breaking point or rupture location.

6. The combination according to claim 5, wherein the desired breaking or rupture location in the connecting wall parts is formed by a notch weakening the cross-section of the wall part.

7. A detonator strip for toy weapons substantially as herein described with reference to and as shown in Figures 1, 2 and 5 to 7, or Figures 3 to 8 of the accompanying drawings.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1982. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained