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BUFFER SYSTEMS FOR AUTOMATIC FIREARMS

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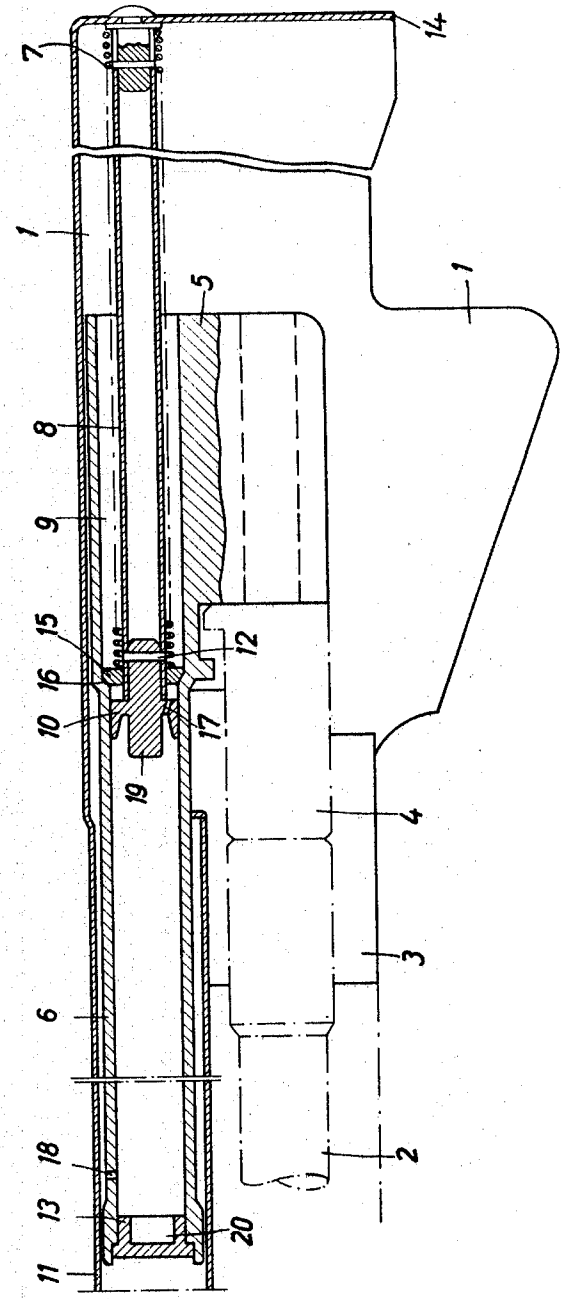

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BUFFER SYSTEMS FOR AUTOMATIC FIREARMS

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The invention relates to buffer systems for automatic firearms having rigidly or semi-rigidly locked breech mechanisms. Such weapons generally require a breech mechanism buffer which is able to absorb the surplus energy of the recoiling breech mechanism harmlessly in order to dissipate it partially or wholly or supply it to the breech mechanism on forward movement of the latter to initiate the breech closing process. The forward movement of the breech mechanism is generally effected by means of a helical breech closure spring which is frequently arranged in a cylindrical recess in the breech mechanism or in a part of the breech mechanism. What is described as surplus energy is that part of the total kinetic energy which is not required to compress the closure spring.

The breech mechanism buffer is generally arranged in the rear part of the weapon and frequently consists of compression springs, laminated cup springs, friction springs or rubber shock absorbers. Buffers of that kind, which have been mainly employed heretofore, have not always been satisfactory, however, because they are rather costly to manufacture, are heavy and require an excessive amount of space to accommodate them. Pneumatic or hydraulic buffers are also known for this purpose, but these have likewise not been successful in practice for the reasons just given.

The present invention provides a pneumatic buffer system which, first, renders possible the resilient absorption of the surplus energy and which, second, can be carried into effect in a very simple and advantageous manner in weapons having rigidly or semi-rigidly locked breech mechanisms, without it being necessary to provide additional parts which increase the weight of the weapon and its production costs.

The invention consists in that the cylinder of the pneumatic buffer system is a component part of the breech mechanism or of a part of the breech mechanism which is connected thereto. The pneumatic buffer system has a piston which is advantageously supported in the rear portion of the weapon and extends into the cylinder which is open at the rear.

The invention has a very specially advantageous effect in the case of the rifle now known as the "G3" rifle and rifles of similar type, since in these rifles the breech mechanism is connected to a breech mechanism carrier which has a cylindrical bore for receiving a breech closure spring. In these weapons, the invention can be put into effect in a compartively simple manner because parts of the weapon which are in any case present for performing other functions, namely the breech mechanism carrier with the closure spring tube and also the spring guiding tube, are employed as the main elements of the pneumatic buffer system. The closure spring tube is closed at its front end by a plug or cover and the piston is mounted on the front end of the spring guiding tube. In this connection, the invention even brings a reduction in weight and, in addition, a decrease in manufacturing costs, since the buffer heretofore provided in the breech or in the stock of the weapon is dispensed with.

The buffer system according to the invention can be modified in many ways. Thus, for example, one or more exhaust and suction orifices which can be closed by the

piston may be provided in the cylinder wall, or, in manner known per se, the piston may also be formed with a throttling bore. These steps can be taken in each case in dependence on the particular requirements, i.e., according to whether only a part of the kinetic energy is to be absorbed resiliently and supplied to the forwardly moving breech mechanism, or whether the surplus energy is to be entirely dissipated.

An embodiment of the invention suitable for an automatic weapon having a semi-rigid breech mechanism will now be described in greater detail with reference to the accompanying drawing which is a side view partly in section of part of the weapon.

Reference numeral **1** designates a casing of the weapon, in which a barrel or inner or A tube **2** is fixed by means of a locking piece **3**. The breech mechanism of the weapon consists essentially of a breech mechanism head **4** and a breech mechanism carrier **5** which has a tube-like extension **6** positioned above the barrel **2** which is positioned in a loading tube **11** fixed to the casing **1**. The breech mechanism is arranged to be longitudinally slidable in the casing and, after recoiling after the shot has been fired, is brought into its forward closing position again by a closure spring **7**. A guide tube **8**, which is fixed in the rear part of the casing, serves to hold and guide the closure spring **7**. The guide tube **8** projects through a cylindrical recess **9** in the breech mechanism carrier **5** and into the spring tube-like extension **6**. The guide tube **8** carries at its forward or nozzle end a piston head **10** which is secured to the tube by means of a pin **12** and may consist with advantage of a plastics or some other suitable material. By fixing with a sealing effect, for example screwing, a cover **13**, which may likewise be made with advantage of a plastics material, into the front end of the tube-like extension **6**, the compression chamber or cylinder of a pneumatic piston-cylinder assembly is created between the cover **13** and the piston head **10**. The closure spring **7** is held on the guide tube **8** between a rear base plate **14** of the casing and a supporting ring **15** mounted slidably on the guide tube **8**, an internal shoulder **16** being provided in the cylindrical recess **9** and forming an abutment for the supporting ring **15**.

On recoil of the breech mechanism as a result of gas pressure occurring on firing, the closure spring **7** is compressed and at the same time air between the cover **13** and the piston head **10** is compressed, whereby a pneumatic buffer action is obtained by the adiabatic compression of the air. The degree of the compression can be varied according to the quantity of energy to be dissipated by providing a small bore **17** in the piston head **10** or in the cover **13**. In the example shown in the drawing, a small bore **18** is also provided adjacent the forward end of extension **6** in the wall thereof. Shortly before the end of the recoil of the breech mechanism, bore **18** is closed by the piston head **10**, whereby at the moment of reversal of the breech mechanism a somewhat stronger compression is produced which is supplied to the then advancing breech mechanism. Furthermore, to this end, the piston may have a stud **19** projecting beyond the piston and which engages in a recess **20** in the inside of the cover **13** and dimensioned in accordance with the diameter of the stud at the end of the recoil of the breech mechanism. These measures can each be employed by themselves or together.

In the example of embodiment, atmospheric air is the fluid in the pneumatic buffer system. It is also possible, however, to provide an enclosed gas in the space between cover **13** and head **10** or to supply a gas to that space, for example the gas of the burnt propellent charge. The enclosed gas may be under pressure prior to movement of the piston head into the cylinder.

We claim:

1. An automatic firearm comprising a casing, a breech carrier mounted in said casing and having a tube-like extension and a cylindrical recess, a guide tube secured at one end in the casing and extending through the cylindrical recess and into the tube-like extension, a piston head mounted to slide in the tube-like extension and secured at the other end in the guide tube, a supporting ring abutting on a shoulder at the junction of the cylindrical recess and the tube-like extension to support the guide tube at its other end, and a coil spring around the guide tube bearing at one end against the casing and the other end against the supporting ring, the guide tube forming simultaneously a piston rod for a pneumatic buffer with the tube-like extension and the piston head therein secured to the guide tube.

2. An automatic firearm according to claim 1, in which a bore is provided in the piston head to control the degree of compression of fluid in said tube-like extension.

3. An automatic firearm according to claim 1, in which a bore is provided in the piston head to control the degree of compression of fluid in said tube-like extension, and in which at least one orifice is provided in a wall of the tube-like extension for controlling the degree of compression of fluid therein, said orifice being closed by said piston head at a predetermined point on the travel thereof.

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