Aug. 11, 1925. 1,548,845

J. A. DICKERMAN ET AL.

PROCESS OF AND MEANS FOR FORMING WADS AND INSERTING THEM INTO CARTRIDGE SHELLS

Filed Dec. 2, 1920 3 Sheets-Sheet 1

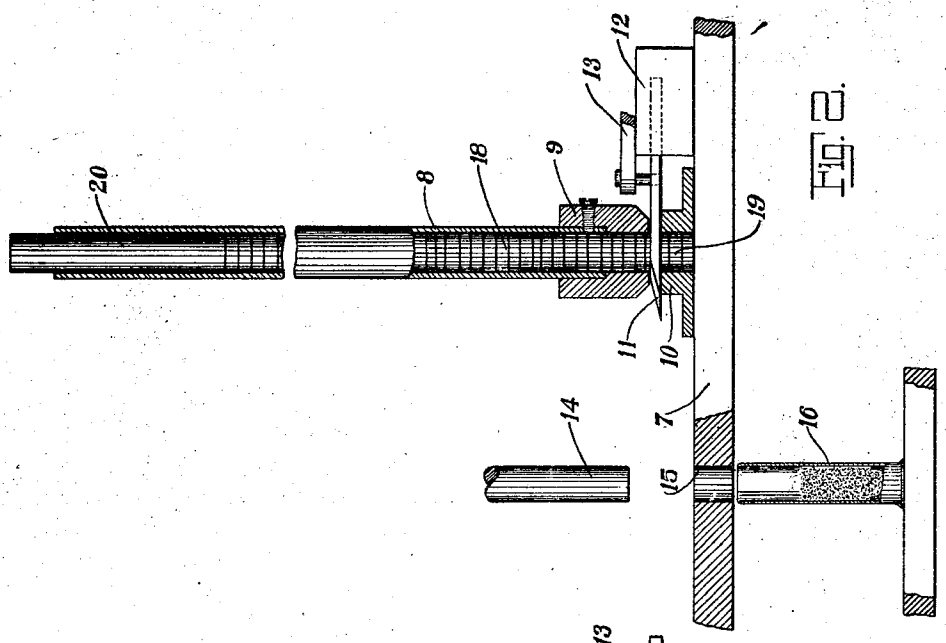


Fig. 2.

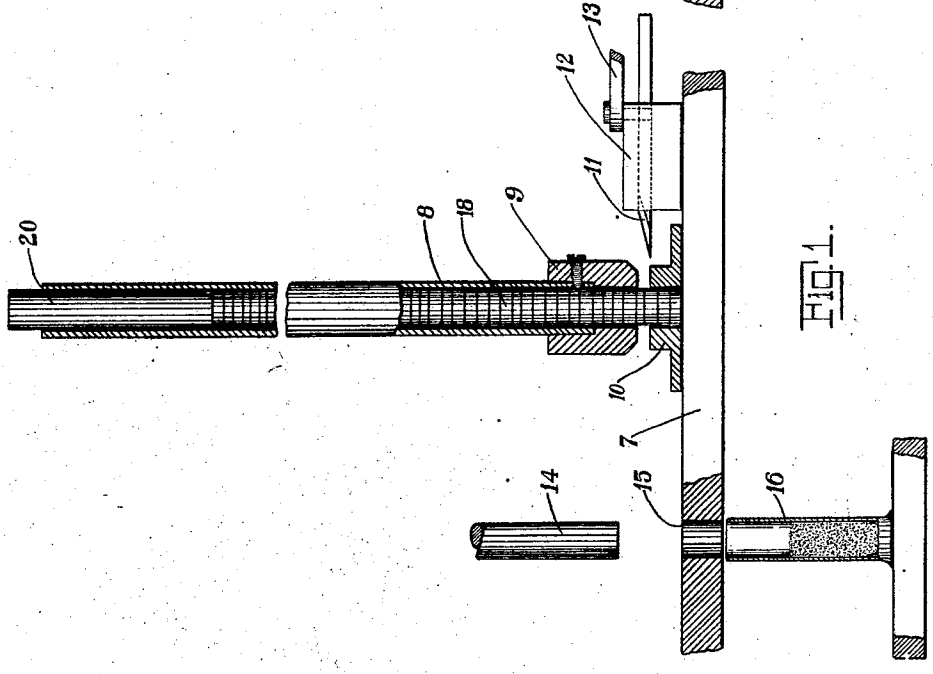


Fig. 1.

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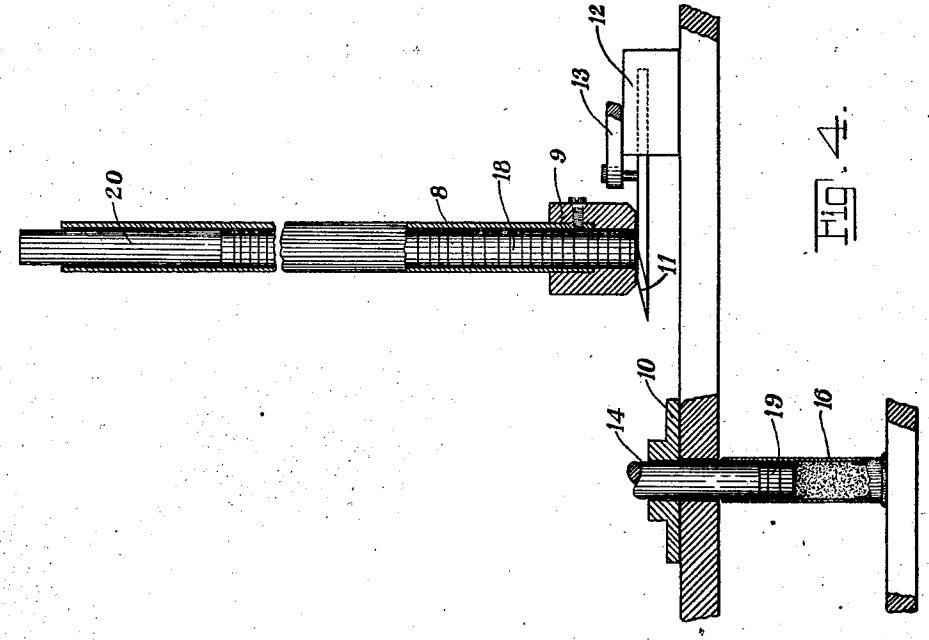


Fig. 4.

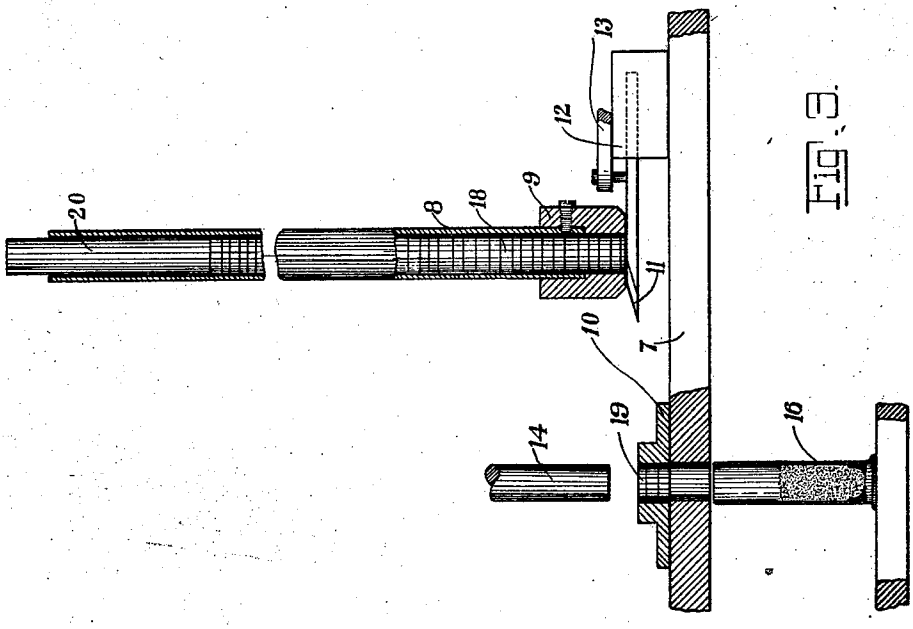


Fig. 3.

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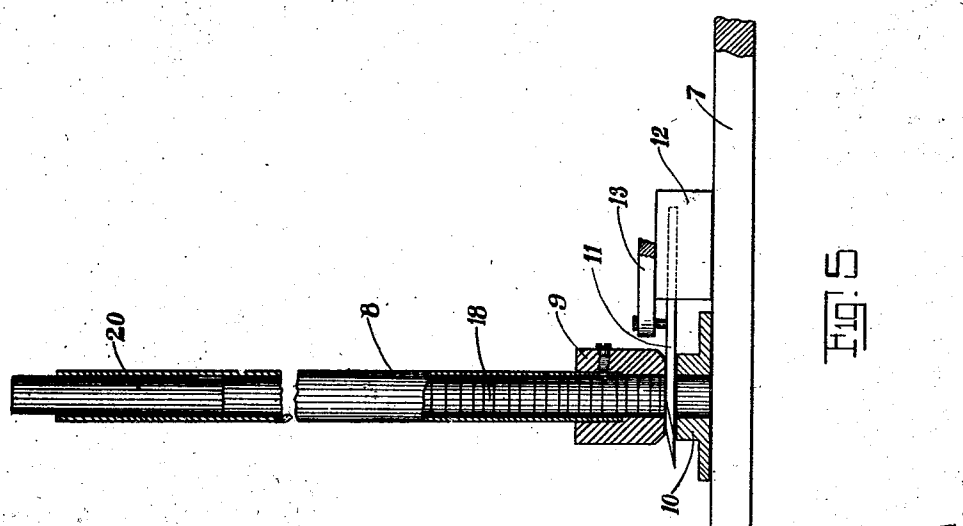


Fig. 5

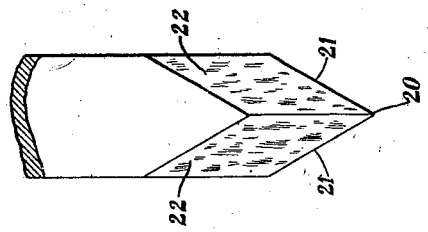


Fig. 6.

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Patented Aug. 11, 1925. 1,548,845

UNITED STATES PATENT OFFICE.

JOHN A. DICKERMAN, OF BRIDGEPORT, AND HERBERT V. LECKIE, OF STRATFORD, CONNECTICUT, ASSIGNORS TO REMINGTON ARMS COMPANY, INC., A CORPORATION OF DELAWARE.

PROCESS OF AND MEANS FOR FORMING WADS AND INSERTING THEM INTO CARTRIDGE SHELLS.

Application filed December 2, 1920. Serial No. 427,839.

To all whom it may concern:

Be it known that we, JOHN A. DICKERMAN and HERBERT V. LECKIE, citizens of the United States, residing, respectively, at Bridgeport, in the county of Fairfield and State of Connecticut, and at Stratford, in the county of Fairfield and State of Connecticut, have invented a certain new and useful Improved Process of and Means for Forming Wads and Inserting Them Into Cartridge Shells, of which the following is a specification.

Uniformity of velocity and pattern is an essential requirement in shot cartridges. Velocity and pattern are affected by many factors, among which are the thickness, density and weight of the wads used and the quantity of the shot load and powder load, upon how firmly the powder is packed in the cartridge and upon the extent of the crimp over the top wad. Wads have heretofore generally been stamped from sheets of card board, felt, paper felt, or other suitable sheet material. As these sheets vary greatly in thickness the wads made therefrom vary accordingly. As four or five wads are generally used in each shot cartridge, such errors in thickness may accumulate and become so excessive that the powder will be packed too tight or too loose or the crimp be too short or too long, resulting in prohibitive variations in velocity and pattern.

In order to compensate somewhat for variations in wad thickness it has been customary to use a crimping tool which is under spring pressure so that it will bear upon the shell with no more than a certain predetermined pressure. In such cases if the wads are too thick the crimp will be shorter than required and the shell will come out too long; if too thin the crimp is too long and the shell too short. This will result in the double objection of irregular crimping and excessive variation in shell length.

It is an object of this invention to form wads from a supply of wad material in such a way that they will be of uniform thickness irrespective of variations in the sheet material from which they may be made. To this end it is an object to provide a process of forming wads by severing a wad of appropriate thickness from a cylinder of wad material which may be of continuous construction or formed of a large number of relatively thin wads preferably stamped from sheet material. A further object is to sever such wads while under a pressure approximating the loading pressure.

A further object is to provide means for carrying out such process.

The various steps of the process in its preferred form and a means for carrying out such process is shown in the accompanying drawings, wherein:—

Fig. 1 is a side elevation partly in section of the means for carrying out the process showing a measured thickness of wad material in the wad measuring and carrying means, ready to be severed,

Fig. 2 shows the wad severed,

Fig. 3 shows the severed wad moved into position for placing the wad in a cartridge,

Fig. 4 shows the wad inserted into the cartridge,

Fig. 5 shows the wad measuring and carrying means returned to its original position with the severing knife forward,

Fig. 6 is a plan view of a preferred form of severing knife.

In said drawings the numeral 7 indicates a suitable base as the bed plate of a machine, 8 a preferably vertically disposed wad material supply tube which may be supported in a fixed position with respect to the bed plate by a collar 9. The numeral 10 indicates a collar which may serve as a means for measuring the length of wad material to be severed and for carrying the wad to a position where it may be inserted in the cartridge. It is preferably slidably mounted on the top surface of the bed plate 7. Adjacent said collar 10 is a suitable severing knife 11, the cutting edge of which cooperates with the top edge of the collar 10 and serves to sever a proper thickness of wad from the wad material 18 in the tube 8. This knife may be supported by any suitable means as the knife guide 12 and operated by any suitable means as a link 13. After the wad has been severed it is carried by the collar 10 into alinement with an opening 15

in the bed plate which opening registers with a cartridge 16 and with a wad placing punch 14 as shown.

The steps of the process and the operation of the means for performing the process are readily understood from the drawings. For example, in Fig. 1 a measured quantity of wad material is present in the collar 10. The knife 11 is retracted and the punch 14 is in its upper position. In Fig. 2 the knife has moved forward and severed a wad 19 of a proper thickness. In Fig. 3 the collar 10 has moved into registration with the opening 15 while the knife 11 has remained forward and is holding the remaining wad material in place. In Fig. 4 the punch 14 has moved downward and placed the wad 19 in the cartridge. In Fig. 5 the punch is shown in its upper position and the collar 10 has returned to its original position. The knife 11 is continuing to support the wad material 18. Upon the retraction of the knife 11 the wad material 18 will move downward thereby placing a proper quantity of wad material in the measuring collar 10, whereupon the parts have returned to the position of Fig. 1 and the cycle of operations has been completed.

In view of the tenacious nature of certain wad materials it has been found necessary to provide a special type of severing knife, a suitable form of which is illustrated in Fig. 6, wherein it is shown as formed of a rectangular bar of metal having a sharp point 20 and cutting edges 21 running back from the point. These cutting edges are produced by forming the beveled surfaces 22 substantially as shown. It has been found that a knife of this kind will be very effective for this purpose and is also well adapted to lift any remaining wad material and support it while the collar 10 is away from its normal position.

The wad material 18 may be in the form of a continuous rod formed in any suitable way, but it is preferably made up of separate discs of wad material stamped from sheets. Such discs will vary greatly in thickness and also in hardness. Some of the wads are so hard that they will be compressed only slightly under the loading pressure while others are so soft that their thickness may be very much reduced. For this reason wads which are of the same thickness before loading may vary greatly in thickness after loading. To overcome this variation it has been found desirable to place a weight 20 upon the wad material in order to insure proper feeding and to compress the soft wads to approximately the thickness they will assume under loading pressure. The weight 20 should be of a size so that the pressure on the wad material caused thereby approximates the loading pressure. As the wads severed by the knife 11 are of uniform thickness when under a pressure approximating the loading pressure it follows that the wads will be of uniform thickness when loaded into the shell.

Having thus indicated the nature of the invention and the preferred means for carrying it out, we desire to claim as new and secure by Letters Patent of the United States:

1. The process of forming a wad which comprises placing a quantity of wad material under pressure and severing a predetermined length thereof.

2. The process of forming a wad from a quantity of wad material which comprises placing a part of said wad material in a measuring collar under pressure and separating the material in the collar from the remaining material.

3. The process of forming a wad which comprises placing a quantity of wad material composed of separate discs in a collar and severing a predetermined length thereof.

4. The process of forming a wad and loading it into a cartridge shell which comprises placing a quantity of wad material under pressure, severing a predetermined length thereof, placing it in registration with a cartridge shell and inserting it in said shell.

5. The process of forming a wad and loading it into a cartridge shell which comprises placing a quantity of wad material under pressure, severing a predetermined length thereof, placing it in registration with a cartridge shell and inserting it in said shell under approximately the same pressure.

6. The process of forming a wad and loading it into a cartridge shell which comprises placing a quantity of wad material in a tube, positioning a measuring collar under said tube, dropping a predetermined length of wad material into said collar, severing a portion, removing the severed material in the collar into registration with a cartridge shell and inserting it therein.

7. The process of forming a wad and loading it into a cartridge shell which comprises placing a quantity of wad material in a tube, positioning a measuring collar under said tube, dropping a predetermined length of wad material into said collar, severing a portion and inserting the severed material in the collar into a cartridge shell.

8. The process of forming a wad which comprises placing a quantity of wad material composed of separate discs of varying thickness in a collar and severing a predetermined length thereof.

9. Apparatus for forming a wad which comprises means for measuring a length of wad material and means for severing the measured portion.

10. Apparatus for forming a wad which

comprises means for measuring a length of wad material, under a predetermined pressure and means for severing the measured portion.

11. Apparatus for forming a wad which comprises a wad material supply tube, a measuring collar in alignment therewith and constructed to receive wad material therefrom, and means for separating the wad material in said collar from the wad material supply and inserting it into a cartridge shell.

12. Apparatus for forming a wad which comprises a wad material supply tube, a measuring collar in alignment therewith and constructed to receive wad material therefrom, means for severing the wad material in said collar from the wad material supply, and means for inserting the severed wad material into a cartridge shell.

13. Apparatus for forming a wad which comprises a wad material supply tube, means for placing wad material therein under pressure, a measuring collar in alignment therewith and constructed to receive wad material therefrom, and means for separating a length of wad material predetermined by the measuring collar from the wad material supply and inserting it into a cartridge shell.

14. Apparatus for forming a wad which comprises a wad material supply tube, a measuring collar in alignment therewith and constructed to receive therefrom wad material composed of separate discs of varying thickness, means for severing the wad material in said collar from the wad material supply, and means for inserting the severed wad material into a cartridge shell.

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JOHN A. DICKERMAN.