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E. H. BIRDSALL

2,364,187

GAUGING MACHINE

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Fig. 1.

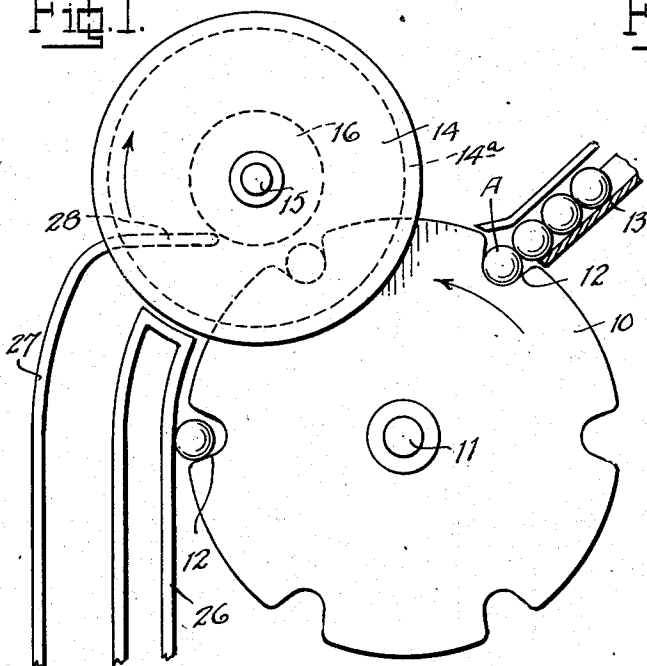


Fig. 2.

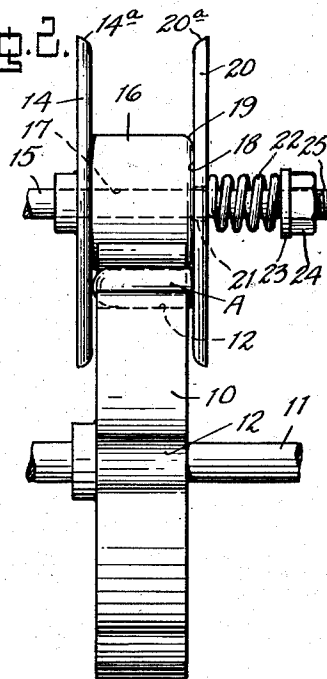


Fig. 3.

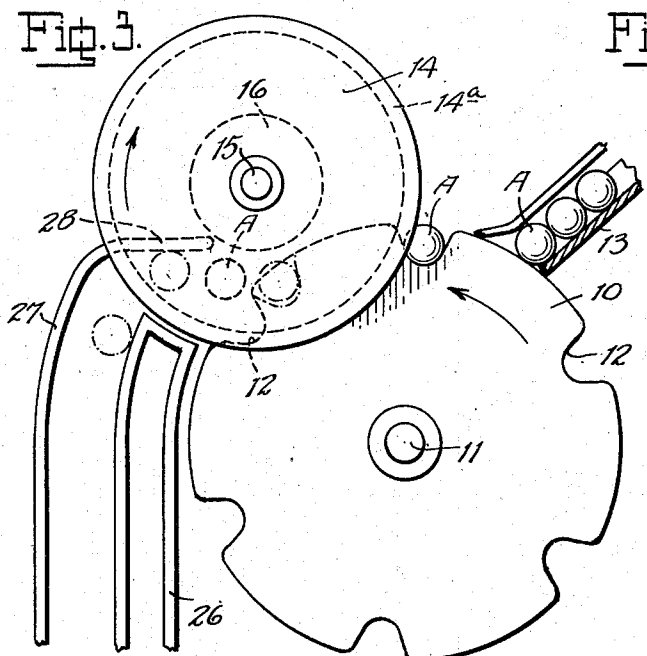
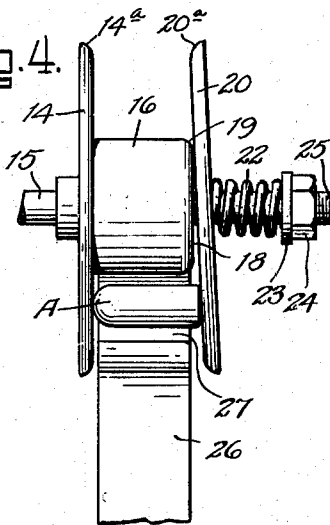


Fig. 4.



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GAUGING MACHINE

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5 Claims. (Cl. 209—108)

The present invention relates to a gauge device, especially for gauging the length of articles by separating articles having a length in excess of a predetermined maximum length from those within such maximum length. It is an object of the invention to provide a device of this character which is extremely sensitive, so that the separation of articles having a very small variation may be accomplished, and which may be automatically operated continuously at relatively high speed. The device is especially adapted for the gauging of the length of bullet components, as for instance a bullet jacket or a bullet slug, and wherein the gun fitting and ballistic requirements of such articles necessitate extremely accurate measurement.

It is particularly proposed to provide a device in which there are provided a pair of rotating disc members disposed in opposed predetermined spaced parallel relation to each other, and between which the articles are individually passed by a suitable feed carrier, one of such disc members being outwardly yieldable with respect to the other, whereby overlength articles will be gripped between such disc members to be separated thereby from proper length articles which will pass freely between the discs.

With the above and other objects in view an embodiment of the invention is shown in the accompanying drawing, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawing:

Fig. 1 is a side elevation of a gauge device according to the illustrated exemplary embodiment of the invention, and showing the passage therethrough of bullet components of predetermined proper length.

Fig. 2 is an end elevation, the feeding chute illustrated in Fig. 1 being removed for the sake of clearness.

Fig. 3 is a side elevation showing a bullet component of excessive length passing through the device, certain positions in the progression of the component as it is carried from the feed carrier to the extractor chute being shown in dot-and-dash lines.

Fig. 4 is an end elevation of the gauging disc element showing its operative position with an excessive length component gripped and carried thereby, the feed carrier element being removed for the sake of clearness.

Similar reference characters indicate corre-

sponding parts throughout the several figures of the drawing.

Referring to the drawing, the gauging device, according to the illustrated exemplary embodiment of the invention, comprises a rotating feed carrier element 10 mounted upon a horizontal shaft 11, and having a cylindrical periphery provided with a series of equally spaced transverse divergent walled pockets 12 for individually receiving the articles A, illustrated as bullet jackets, from a feeding hopper or chute 13 disposed in co-operative relation to the upper side of the peripheral surface of the feed carrier at one side of the central vertical plane of the carrier.

Although the feed carrier shown and described is characterized by rotary movement, it will be understood that the invention is not limited to the specific manner in which the articles are fed to the gauging element hereinafter described; in fact, the rotating feed means has been chosen more as a matter of convenience than necessity, and, obviously, in many cases, it might be advisable to provide a feed carrier having substantially rectilinear or even oscillating movement.

At the other side of the central vertical plane of the carrier, the latter moves between the gauging element of the device, this gauging element comprising a circular gauging disc member 14 rigidly mounted upon a horizontal shaft 15 and provided at its inner side with a flat vertically disposed surface against which is engaged the inner flat end of a cylindrical gauge means 16, having an axial shaft engaging passage 17 therethrough, its outer flat end 18 being connected to its cylindrical periphery by an annular rounded corner 19. The length of the cylindrical gauge or spacer block 16, is, of course, the determinate of a particular maximum size of article to be gauged at any one time by the gauging element, and hence an important aspect of the invention is to provide means whereby a ready interchange of spacers 16 of different predetermined maximum gauge lengths may be made so that the gauging element may handle articles of different maximum length with dispatch and without alteration in the remainder of the machine.

Accordingly, the spacer block 16 is freely mounted on the shaft 15, being held in operative position thereon between the disc member 14 and a second disc member 20 which is carried on the opposite end of the shaft 15. As hereinafter described, the disc member 20 is readily demountable from the shaft 15 to permit removal of the spacer block 16 and the substitution therefor of

a spaced block of different predetermined maximum gauge length.

The end wall 18 of the cylindrical spacer block is thus engaged frictionally by the circular gauging disc member 20, which is opposed to the corresponding diameter disc member 14 in normally parallel relation. Moreover, the disc member 20 is provided with a central aperture 21 loosely engaged upon the shaft 15 to permit of relative tilting movement of the disc 20, as will presently more fully appear. The inner peripheral edge surfaces of the disc members are divergently curved, as at 14^a and 20^a, to provide a convergent entrance for the articles to move without obstruction between the parallel inner surfaces.

The shaft 15 projects outwardly from the disc 20 and is provided with a helical spring 22, engaged between the surface of the disc 20 and a retaining washer 23 and nut 24 adjustably engaged upon the threaded end portion 25 of the shaft, this spring yieldably pressing the disc 20 against the end of the gauging cylinder 16 in predetermined spaced parallel relation to the opposed gauging disc 14. In choosing the length of the gauging cylinder 16 to be used in any particular case, account is taken of the maximum length of the component articles to be gauged, so that articles which do not exceed this maximum length will be carried between the spaced discs 14 and 20 by the feed carrier 10 without causing the disc 20 to deflect, while an article of excessive length will deflect the disc 20 against the pressure of the spring 22, whereupon such article is gripped between the discs 14 and 20. The spring pressure upon the disc 20 may be varied as desired by adjustment of the nut 24.

The feed carrier element and the gauging disc element are for the purposes of this disclosure rotated in opposite directions and in timed relation by any suitable drive means, so that the surface speed of the feed carrier in counter-clockwise direction along the circumferential path of the article carrying pockets 12, as indicated by the arrow, corresponds to the surface speed of the circumferential area of the gauging disc element coinciding with the circumferential path of the pockets 12, the gauging disc element being rotated in clockwise direction, as indicated by the arrow. The axis of the gauging disc element is offset from the vertical plane passing through the axis of the feed carrier element, so calculated that the articles gripped between the disc members 14 and 20, as shown in Figs. 3 and 4, are carried out of the divergent walled pockets 12 as the gauging disc element rotates without frictional resistance by the pocket, the divergence of the walls of the pockets being such that the article will move out of the pocket along the circumferential path of movement of the gauging disc element as the pocket swings downwardly along its circumferential path.

At the side of the feed carrier element and beneath the gauging disc element there is provided a retainer plate or wall 26 having its upper portion concentric to the periphery of the feed carrier element and extended beneath the periphery of the gauging disc element, articles of proper length which pass freely between the gauging discs being carried by the pockets 12 from between the disc members along the wall member 26 and dropping by gravity from the pocket as the latter moves below the horizontal central plane, these proper length articles dropping into a suitable receptacle. In spaced relation to the wall

member 26 there is provided a guide wall 27 having its upper end curved inwardly and extended between the disc members 14 and 20 substantially horizontally and constituting a deflecting extractor portion 28 arranged substantially tangentially to the gauging cylinder 16 and adapted to engage the articles gripped between the disc members and guide them toward the periphery of the disc members as the gauging disc element is rotated, these articles moving from between the disc and being deflected downwardly in the extractor chute passage between the walls 26 and 27 to a suitable receptacle. As the article is released the disc member 20 resumes its normal parallel position, so that it is in position to gauge the successive article being moved between the disc members by the feed carrier element.

The form of the invention illustrated in the drawing and described herein is typical and illustrative only, and it is evident that the invention is capable of embodiments in other forms, all falling within the scope of the appended claims, which are to be broadly construed.

What I claim is:

1. In a length gauge device, rotatable gauge means comprising a pair of spaced disc members having opposed parallel substantially rigid surfaces forming a passage for gauging the length of articles passed between said surfaces, at least one of said disc members being outwardly yieldable with respect to the other disc member through the engagement between said disc members of an overlength article, whereby such overlength article is gripped between said disc members, and a rotatable article feed carrier element rotatable in the opposite direction of rotation from said gauge means and having a plurality of spaced transversely extending open ended divergent walled article receiving pockets arranged to have passage between said disc members to successively feed articles between said disc members.

2. In a length gauge device, rotatable gauge means comprising a pair of spaced disc members having opposed parallel substantially rigid surfaces forming a passage for gauging the length of articles passed between said surfaces, at least one of said disc members being outwardly yieldable with respect to the other disc member through the engagement between said disc members of an overlength article, whereby such overlength article is positively gripped between said disc members and carried therewith, a rotatable article feed carrier element rotatable in the opposite direction of rotation from said gauge means and having peripheral article receiving means arranged to have passage between said disc members to successively feed articles between said disc members, extractor means engaged between said disc members disposed at an outward angle in the rotary path of an article gripped between said disc members whereby such article is removed therefrom, and discharge means for guiding articles remaining in said feed carrier.

3. In a length gauge device, gauge means comprising a shaft, a spacer member on said shaft, a pair of disc side members respectively at each side of said spacer member having opposed parallel substantially rigid surfaces forming a passage for gauging the length of articles passed between said surfaces, at least one of said side members being outwardly tiltable with respect to said spacer member and other disc side member through the engagement between said side members of an overlength article, and spring means surrounding said shaft arranged to press said movable

side member yieldably toward said spacer member into a position substantially parallel with said other side member, whereby such overlength article is gripped between said side members, and means to remove a gripped article from said discs and separate the same from articles of lesser length.

4. In a length gauge device, rotatable gauge means comprising a shaft, a spacer member on said shaft, a pair of disc side members respectively at each side of said spacer member having opposed parallel substantially rigid surfaces forming a passage for gauging the length of articles passed between said surfaces, at least one of said side members being outwardly movable with respect to said spacer member through the engagement between said side members of an overlength article, spring means surrounding said shaft arranged to press said movable side member yieldably toward said spacer member, whereby an overlength article is gripped between said side members, a rotatable article feed carrier element rotatable in the opposite direction of rotation from said gauge means, and having peripheral article receiving means arranged to have passage between said disc member to successively feed articles between said disc members, an extractor disposed

at an outward angle in the rotary path of an article gripped between said disc members, whereby an article is removed therefrom, and guide means having a surface for guiding articles not gripped by said discs.

5. In a length gauge device, rotatable gauge means comprising a pair of spaced substantially rigid disc members having opposed parallel surfaces forming a passage for gauging the length of articles passed between said surfaces, at least one of said disc members being outwardly tiltable with respect to the other disc member through the engagement between said disc members of an overlength article, spring means urging said movable disc member so that it is substantially normally parallel to said other disc member, a carrier for moving articles between said disc members, whereby such overlength article is gripped between said disc members, extractor means engaged between said disc members disposed at an outward angle in the rotary path of an article gripped between said disc members whereby such article is removed therefrom, and guide means having a surface cooperating with said carrier to guide standard length articles to a discharge point.

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