

[54] MUZZLE CHOKE

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[52] U.S. Cl.42/79

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[58] Field of Search42/79

[56] References Cited

UNITED STATES PATENTS

587,801	8/1897	Durnford	42/79
966,889	8/1910	Devol	42/79
1,227,987	5/1917	Wright	42/79

2,098,617	11/1937	Cutts, Jr.	42/79
2,167,173	7/1939	Fleming	42/79
2,602,255	7/1952	Cutts	42/79
3,226,871	1/1966	Sargeant et al.	42/79
3,492,750	2/1970	Ashbrook et al.	42/79

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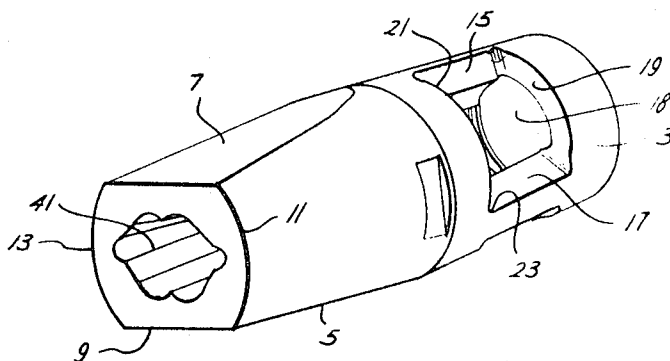
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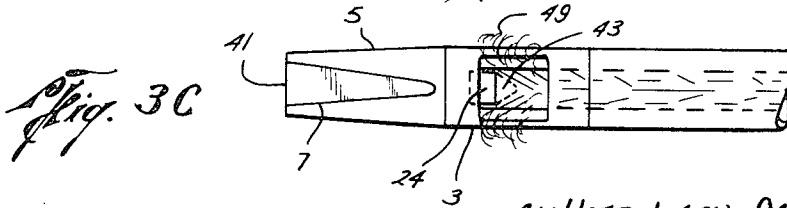
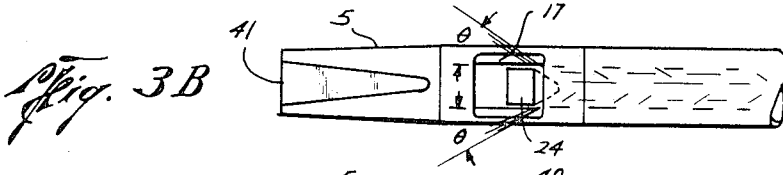
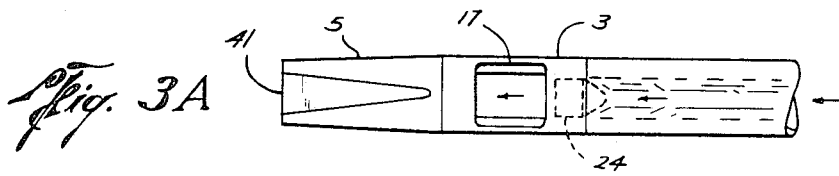
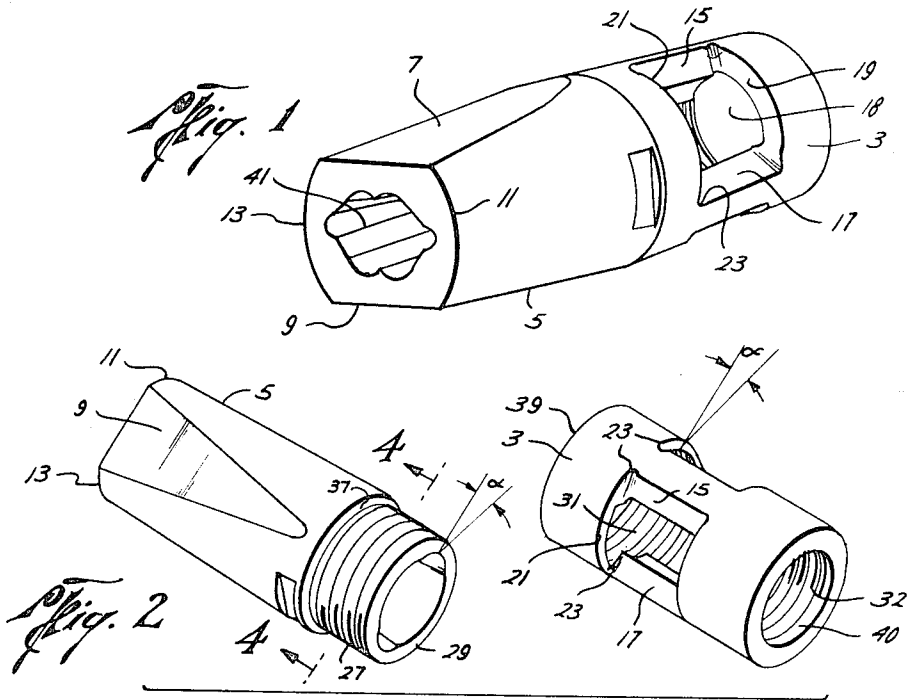
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ABSTRACT

A shotgun muzzle or nozzle construction for producing a uniformly distributed pattern of shot or projectiles within a predetermined confined area. The forward section or diverter is provided with a plurality of internal axially extending shot- or projectile-diverting ridges which define wall means for selectively guiding the projectiles into relative orientation to one another. The ridges define a plurality of walls, the purpose of which is to establish the pattern of projectiles upon a target. Precalculated angular relationships of the various walls and diverter ridges thereon contribute to marked effectiveness of the device.

23 Claims, 18 Drawing Figures

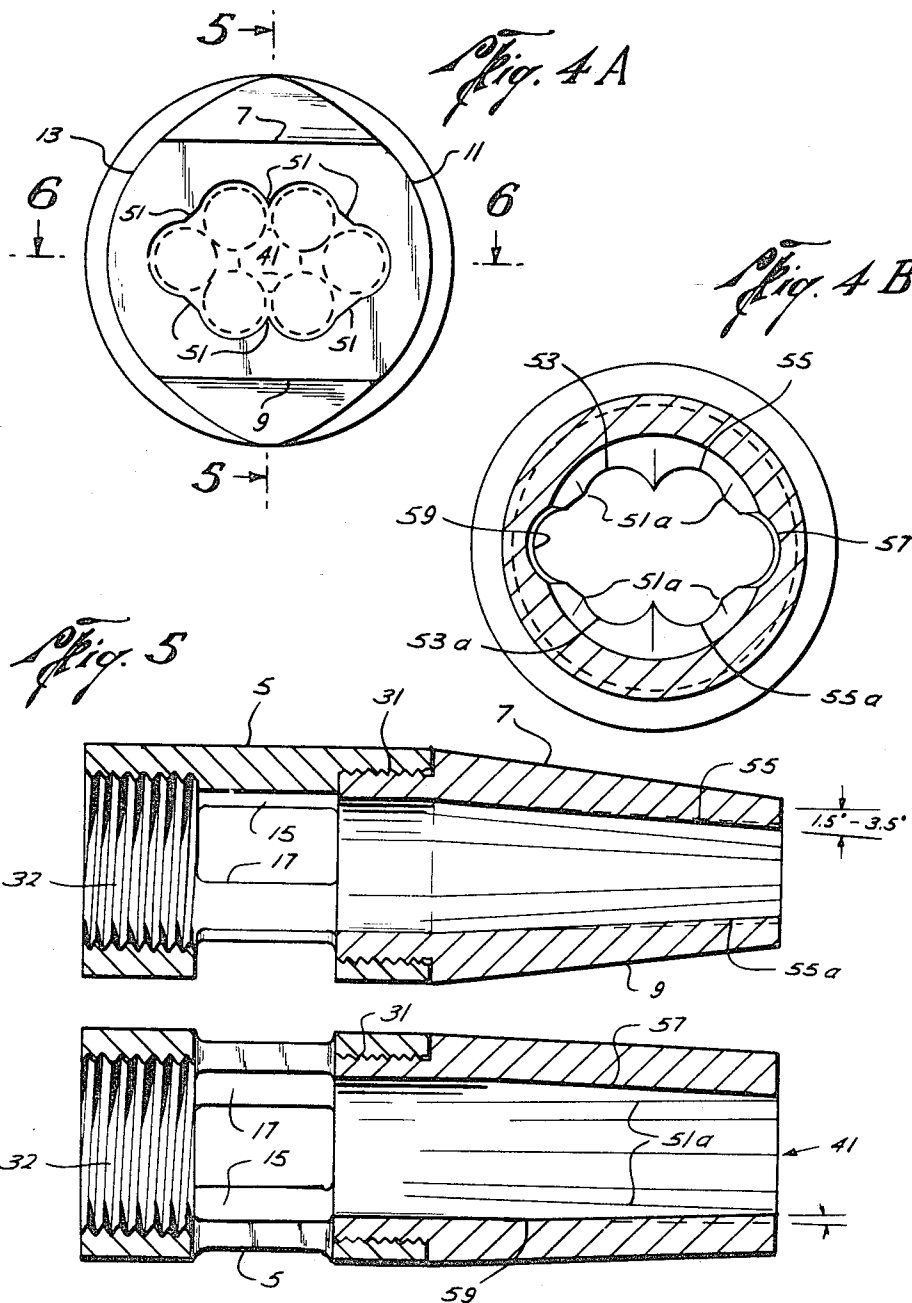




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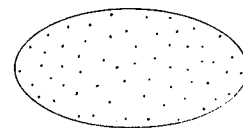
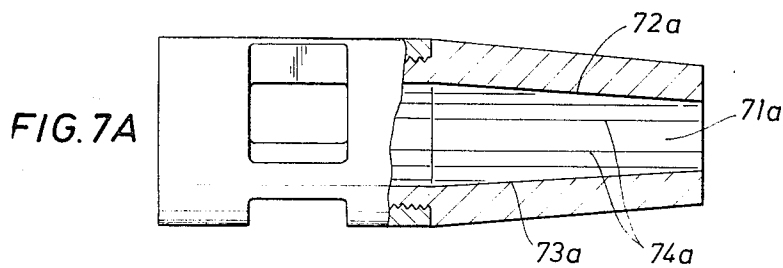


FIG. 7C

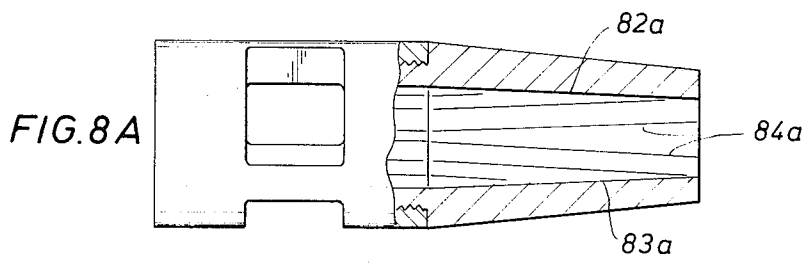
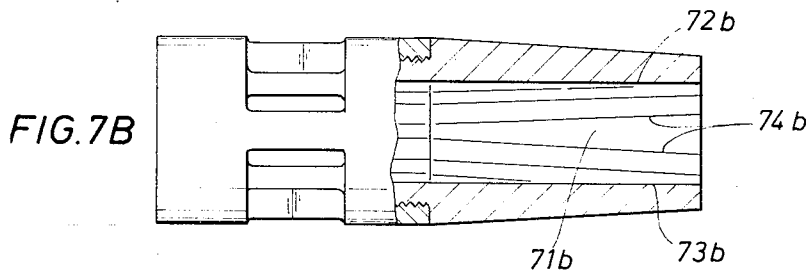


FIG. 8C

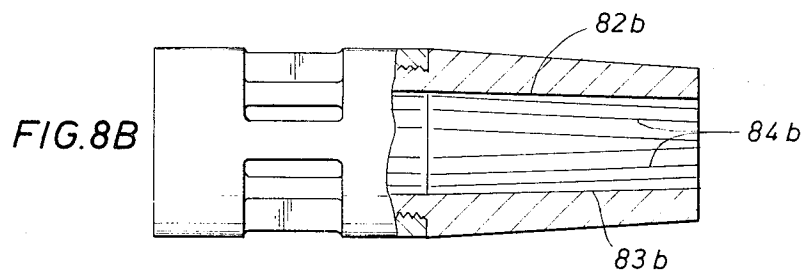
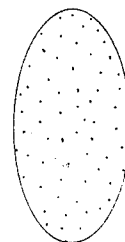
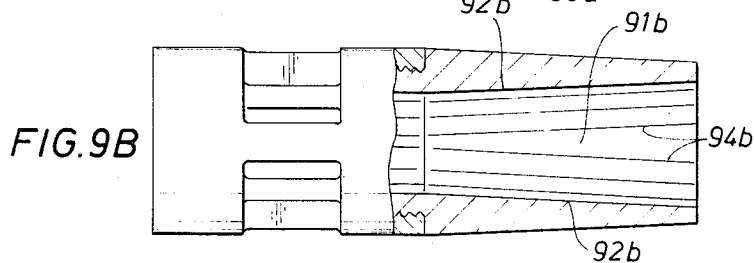
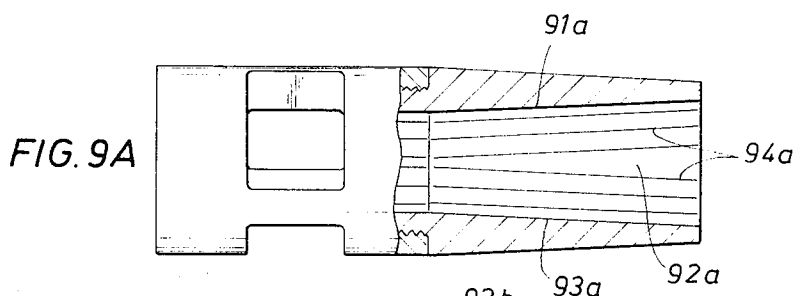
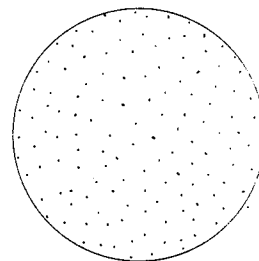


FIG. 9C



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MUZZLE CHOKE

BACKGROUND OF THE INVENTION

The present invention relates to a muzzle or nozzle control device for use with firearms or other multi-projectile emitting articles and constitutes a continuation-in-part of our prior application bearing Ser. No. 683,200 filed Nov. 15, 1967 and now U.S. Pat. No. 3,492,750, titled Muzzle Choke.

The invention described hereinafter is explained with reference to its application on shotguns as a device for controlling not only the pattern of shot on a remote target but also the distribution of shot therein. It is to be understood however that the principles set forth and the teachings relating thereto are readily applicable to any projectile emitting device such as for example a high pressure blasting nozzle and that the foregoing explanations and descriptions making reference to shotguns and shells therefor are for exemplary purposes only.

It is desirable in a variety of firearm applications and other uses wherein a plurality of projectiles traverse a tubular body at high velocity to produce a projectile distribution pattern of predetermined configuration upon a remote target. For example it is desirable to have a shotgun shell distribution produce an elliptical pattern in which the major axis is in the horizontal plane. Such a shot distribution is found to have considerable value in numerous and varied applications such as game hunting, guerilla warfare, and civil riot control. The primary advantage of such a shot distribution pattern is obvious, that being a much higher probability of striking the intended target with the missiles of the firearm.

Although numerous attachments, chokes, and other forms of projectile pattern shaping devices have been designed heretofore, whether it be for shotgun muzzles or forms of nozzles, none have adequately and reliably solved the problem of predetermined projectile distribution. Such devices are generally bulky, difficult and/or dangerous to use, and do not provide results in accordance with the intended or desired purpose. Specifically, in the realm of firearms, the problem has been engaged from a number of viewpoints by the prior art including the utilization of gas relieving apertures in the muzzle for venting explosion gasses quickly to atmosphere in a manner similar to the present invention, laterally extending slots in the wall of the shotgun bore or in the walls of a attachment thereto for permitting horizontal expansion of the shot pattern upon firing (U.S. Pat. No. 3,226,871), and a wide variety of conventional and rather unconventional choke designs. Although certain of these devices have, in fact, tended to achieve some predetermined pattern of shot, the pattern has not been reasonably predictable, nor has the success in achieving such a pattern been consistent over a plurality of firings. The devices themselves have, at times, proven dangerous, due to their tendency to fracture after a number of repeated firings. It is these shortcomings and deficiencies which has occasioned and motivated the present invention.

This invention constitutes a first recognition of the sophisticated requirements necessary for achieving controlled distribution of the missiles which are projected out of a tubular body. There is described herein a cage and diverter device working cooperatively to both vent specific types of gasses from the bore of a shotgun, while at the same time permitting the conventional choking action in conjunction with other structures for producing a predetermined distribution of shot upon a remote target. The invention, therefore, not only obviates the primary obstacle to which prior art devices have been directed but, in addition, provides a structure which is both reliable and safe; and which is easy to handle, simple in operation, efficient in use, and relatively inexpensive to manufacture.

These, and numerous other features and advantages of the invention, shall become more readily apparent to the reader upon examination of the following detailed description, claims, and drawings, wherein like numerals denote like parts in the several views, and wherein:

FIG. 1 shows in perspective a preferred form of the invention.

FIG. 2 shows the diverter and cage sections of FIG. 1 removed from each other and viewed obliquely from the rear thereof.

FIG. 3a illustrates schematically a first position of a shotgun shell as it traverses the bore.

FIG. 3b illustrates a second position of a shot charge as it traverses the bore toward the cage aperture and showing also the forms of gasses acting upon the wad of the shot charge.

FIG. 3c shows a third position of the shot charge as it traverses the bore and after the wad of the charge has substantially passed the cage aperture of the section of the subject invention.

FIG. 4a illustrates a front view or the exit end of the invention of FIG. 1.

FIG. 4b illustrates a sectional view of the diverter of FIG. 2 along the plane 4—4 thereof.

FIG. 5 is a vertical sectional view along the plane 5—5 of FIG. 4a.

FIG. 6 is a horizontal sectional view along the plane 6—6 of FIG. 4a.

FIG. 7a is a vertical sectional view in the longitudinal plane showing the internal wall structure of another form of the invention.

FIG. 7b is a horizontal sectional view in the longitudinal plane showing the internal wall structure of the device of FIG. 7a.

FIG. 7c illustrates the distributional pattern of shot to be expected from the device of FIGS. 7a and 7b.

FIG. 8a is a vertical sectional view in the longitudinal plane showing the internal wall structure of yet another form of the invention.

FIG. 8b is a horizontal sectional view in the longitudinal plane showing the bottom wall of the device of FIG. 8a.

FIG. 8c illustrates the pattern of shot distribution to be expected from the device of FIGS. 8a and 8b.

FIG. 9a is a vertical sectional view in the longitudinal plane showing the side walls of still another form of the invention.

FIG. 9b is a horizontal sectional view in the longitudinal plane showing the internal bottom walls of the device of FIG. 9a.

FIG. 9c illustrates the pattern of shot distribution to be expected from the device of FIGS. 9a and 9b.

With reference now to FIGS. 1 and 2 of the drawing, there is shown in preferred form, but for exemplary purposes, the diverter 5 and cage sections 3 of the invention. The diverter is characterized by an elongated cylindrical-like body having a right side wall 11 and left side wall 13 opposite one another. Although the diverter is of generally frustoconical configuration, its upper and lower surfaces are machined to define the upper wall 7 and lower wall 9. Machining of these walls tends to reduce the overall weight of the diverter section thus making it easier to handle. Machining such surfaces also tends to maintain substantially constant wall thickness throughout the longitudinal length of the diverter, thus reducing the tendency towards creation of differential metal pressures and fatigue created by elevated temperatures. The rearward portion of the diverter tube 5 is characterized by the threaded end connection 27 which has a reduced diametrical dimension by comparison to the rearward end of the right and left walls 11 and 13 respectively. The magnitude of the difference in diameter is illustrated by the diverter flange wall 37 which mates in intimate contact with the front wall 39 of the cage member 3.

Cage member 3 is of generally cylindrical configuration, having an elongated central bore 40 axially aligned with the diverter bore 41 described hereinafter. The elongated central bore 40 is characterized by the internal threaded connection 31, 32 at the exit and entry ends thereof respectively. The threaded connection 31 at the exit end of the cage is of such predetermined internal diameter as to cooperatively receive and engage a threaded connection 27 of the diverter tube 5. The cage further includes a plurality of apertures circumferentially disposed about the surface thereof, the apertures being defined by the longitudinal aperture walls 15, 17 (See FIG. 1) and the rearward and forward lateral aperture walls

19, 21 respectively. The four walls intersect to form a plurality of the apertures such as 3 as is shown in the illustration. The longitudinal aperture walls 15, 17 are of planar type surface except at the forward corners thereof, where a fillet or corner curved surface 23 is provided so as to form a smooth intersection with the forward lateral walls 21. These fillets or grooves on the corners of the cage vertical and horizontal walls serve to enhance turbulence of escaping gasses upon the passage of a projectile through the cage member. Such turbulence lowers the pitch of audio-type waves, thus causing a very substantial reduction in the overall noise level when the firearm is fired.

As is best shown in FIGS. 3a through 3c, the diverter and cage of the invention are ordinarily affixed to the end of a muzzle, such as that of a shotgun. In FIG. 3a there is shown the position of a typical wad 24 of a shotgun shell as it approaches the apertures of the cage member 3 subsequent to firing. Prior to the time at which the shell reaches the aperture, there of course can be no escape of any of the gasses behind the shell. Upon intersection of the wad with the aperture, there is created an immediate release of the gas pressure behind the wad. It has been found in accordance with this invention that the gases following the wad as it passes through the cage and diverter may be generally considered to be either of the "hard gas" variety or the "soft gas" variety. The "hard gas" is generally of a laminar fluid species while the "soft gas" is more turbulent in nature. In accordance with the invention, it is further known that as the rear wall of the wad opens from the rear lateral wall 19 of the aperture, the gases following the wad are emitted into the aperture at an initial expanding angle which varies from 0°, 8' to 6°, 0'. It will, of course, be recognized that these gases 49 are primarily of a "soft gas" nature and at the time of their initial escape tend to increase the recoil reaction on the muzzle. As these gases expand forwardly, however, they come into contact with the forward lateral aperture wall 21 and react thereon, thus tending to reduce the recoil reaction of the firearm. In order to maximize the effect of the impinging gasses upon this wall, the wall itself is constructed at a 6° angle (or less) with respect to a plane running perpendicular to the longitudinal axis of the diverter tube. The diverter tube rear wall 29 is similarly sloped at an angle alpha, or in the maximum case, 6°, since this wall constitutes an extension of the forward lateral wall 21 of the aperture when the diverter tube is threaded into the cage member. It will thus be seen that the angle alpha is so calculated as to create a surface which is perpendicularly oriented with respect to the impact points of the "soft gas" 49. The forward lateral wall 21 of the aperture is likewise so oriented. The reason for the angular deflection of gases as explained above lies in the creation of the "hard gas" characteristic or laminar gas layers 43 discovered as an incident to this invention. The "hard gas" 43 proceeds behind the shell wad 24 and is of generally conical shape. The conically shaped "hard gas" or concentrated gas molecules act as a deflecting cone for gases following therebehind, thus causing such gases to be deflected outwardly at the angle disclosed above. These following gasses create a pulsing reaction on the forward lateral aperture wall 21. This pulsing action is found to account for a significant increase, of up to 5 percent, in the projectile velocity. An advantage of this is the improved pattern predictability which results. A FURTHER ADVANTAGE OF THE SPECIFIC APERTURE STRUCTURE OF THE CAGE MEMBER 3 resides in the substantial absence of any "flash" either at the exit end of the diverter tube 5 or at the apertures of the cage member 3, upon firing. This may be explained by the stacking effect of the heated gasses [FIG. 3c] in the central bore of the cage member as the shell passes therethrough and by the calculated deflection of gasses back towards the apertures. This reflection of the "soft gas" flow tends to increase the gas temperature within the cage, thus elevating the pressure therein. As a consequence, the gases are ignited well within the bore of the cage member, rather than outside it, thus substantially eliminating the observance of any illumination upon firing of the firearm.

Reference may now be made to FIGS. 4a and 4b in conjunction with FIGS. 1 and 2. Here, there is shown the shot diverting ridges 51 for creating the predetermined pattern of shot orientation with respect to one another upon a target all in accordance with the teachings herein. Although the diverter bore 41 is shown in FIG. 1 to include three diverter ridges 51 on each the upper and lower surface, it will be recognized that any number of diverter ridges 51 can be utilized in the practice of this invention. The function of the semi-circular areas or walls 53, 55 which characterize the diverter tube and which are defined by the diverter ridges 51 is to guide in a predetermined manner the shot pellets of a shell as they traverse the bore. Thus the number of walls approximates the number of pellets in a given plane transverse to the longitudinal axis. Guiding of the pellets is accomplished by sloping the walls in either a divergent or convergent manner with respect to one another so as to cause either compression of the shot pellets into a more condensed pattern or expansion of the pellets into a more scattered pattern. Clearly also, depending upon the ultimate pattern desired on a remote target, certain of the cooperating walls, i.e., top and bottom or right and left side walls, may be angled to achieve a pattern other than horizontally elongate-vertically reduced. For example, if a vertically expanded-horizontally reduced pattern were desired, the rate of convergence of the top and bottom walls would be less than the rate of convergence of the side walls, and in fact the latter walls may even diverge. Specifically referring to a bore for a 04 buckshot such as is illustrated in FIG. 4a, there would reside in front of the wad six spherical pellets disposed in accordance with the cross-sectional pattern of the bore, there being one additional pellet behind the six and at the center thereof. Since the function of the bore, regardless of the number of pellets to be contained therein, is to reshape the shot distribution into, for example, a longitudinally expanded and vertically suppressed manner, the internal slopes of the bore are designed to accomplish this object. Thus, the upper and lower ridges 51 (a) [FIG. 4b and FIG. 5] slope in converging relationship from the diverter rear wall 29 towards the central axis as they approach the front or exit end of the diverter tube. As shown in FIG. 5, the slope may preferably range between 1.5° to 3.5° with respect to the horizontal. When viewed in the horizontal plane (See FIG. 6), the bore likewise converges from the rear end to the front end so as to create the desired longitudinally elongated shot pattern. It is thus seen that the diverter in effect creates a volumetric change per unit of length or as might otherwise be described, volumetrically diminishes and expands the shot per unit of length or advance in the bore. It should further be pointed out that the interior surface of the diverter, or, more specifically, the bore thereof, need not be perfectly smooth as is the common practice. It has been learned in accordance with this invention that the surface may be intentionally roughened so as to disturb the shot as it traverses the bore. This tends to make the shot more amenable to shaping by reason of its constant bouncing and movement as it travels down the bore. In this manner substantially improved shot distribution patterns are achieved. A surface roughness of 50 micro-inches to 125 micro-inches is recommended for this purpose.

As best shown in FIG. 4b and FIG. 2, the central-upper and lower shot diverting ridges are more pronounced nearer the exit end of the diverter tube and, in fact, the ridges gradually merge into the upper and lower surface of the tube as they approach the diverter rear wall 29. Thus, as shown in FIG. 2, these two diverter ridges therefore are not observable.

As explained hereinabove the present invention discloses a structure whereby the pattern of shot expelled from a shotgun is effectively and reliably controlled by the disclosed diverter structure. This structure contemplates a plurality of walls but basically including the upper and lower internal walls and a pair of oppositely disposed side walls. The upper and lower walls may either, as a pair, diverge or converge from rear to front and with respect to one another and to the longitudinal axis of the diverter. Similarly the side walls may be con-

structed to converge or diverge from rear to front with respect to one another and to the central longitudinal axis of the diverter. Clearly, therefore, the relative rate of convergence or divergence of the walls influences and determines the ultimate spread and hence the final pattern of shot upon a remote target. By constructing a diverter having converging upper and lower walls and also converging side walls, an extremely effective and concentrated pattern of shot distribution is created because of the increasingly constricted aperture through which the shot is emitted. Nevertheless, a predetermined pattern of shot can be effected even with such dual convergence of the top and bottom and side walls by having the relative pairs of walls converge at different rates.

Engineered pattern shaping by means of predetermined wall sloping has been found herein to be an effective means for markedly reducing stray and/or random shot distribution. The walls themselves, however, frequently do not prevent excessive concentration of shot within the restricted pattern for which the walls are responsible. Although the shot itself is directed by the walls into a predetermined pattern, it has been found that only through the utilization of engineered ribbing or ridges can there result an even or uniform distribution of shot within such predetermined pattern. Thus, there follows hereafter several exemplary forms of the invention wherein the cooperating walls internally of the diverter are characterized by ridge means which either converge or diverge with respect to the longitudinal axis and which when utilized in the proper manner with the walls produce a uniform distribution of shot within a predetermined pattern and in which there is a remarkably low incidence of stray shot pellets outside the pattern.

One of the numerous structures that may be designed in accordance with the principles of this invention is illustrated in FIGS. 7a and 7b. FIG. 7a shows a vertical sectional view in the longitudinal axis of a diverter thereby revealing one of the side walls 71a. The upper and lower, 72a and 73a respectively, walls are designed to converge towards one another from the rear to the front so as to thereby compress the shot somewhat as it traverses the bore. Integrally characterizing the side wall 71a is a plurality of ridge means 74a the purpose of which are to maintain each shot pellet at discrete distances from one another as they traverse the bore in order to produce an even distribution of shot upon the remote target. It may be noted that the ridge means 74a do not tend to converge or diverge the shot but only to maintain them in parallel manner with respect to a vertical reference distance from the ground. FIG. 7b illustrates a horizontal sectional view through the longitudinal plane so as to reveal the bottom wall 71b. Here, the side walls 72b and 73b are oriented in parallel manner to one another so as to effectively provide little if any constriction of the shot charge as it traverses the bore. Were it not for the ridges 74b which are disposed in diverging manner on the wall, numerous of the shot pellets emerging from the diverter would stray outside the intended pattern. Due to the diverging orientation of the ridge means on the bottom (and top) wall(s), effective restraint is imparted to the directional movement of the shot pellets while they traverse the bore so that upon exit from the bore a direction has been imparted to them which markedly improves the final distribution of the shot upon its target over that which would have been expected had the guidance of the shot been effected by the slope of the walls alone. In FIG. 7c there is shown the expected pattern of distribution of the shot which is produced from the diverter having the walls and ridge characteristics explained in the exemplary form of the invention of FIGS. 7a and 7b.

FIG. 8a shows yet another exemplary form of the invention wherein the top and bottom walls 82a, 83a are disposed in converging relation to one another and the ridge means 84a are disposed in slightly diverging relationship to the central longitudinal axis. There is thus produced a restricted vertical pattern in which the vertical component of direction in the pellets is restrained by the upper and lower walls but effectively directed into an expanded vertical direction by the ridges

84a. The side walls 82b, 83b [See FIG. 8b] are likewise disposed to converge towards one another from rear to front but the ridge means 84b thereon converge rather than diverge like the ridge means in the side walls. Thus, the effect of the ridge means 84b on the pattern [See FIG. 8c] is to constrict and concentrate the lateral dimension of the pattern while its vertical dimension is being expanded.

In FIG. 9a there is shown still another exemplary form of the invention wherein the top and bottom walls 91a, 93a respectively, are disposed in diverging manner with respect to one another. The side wall(s) 92a are characterized by ridge means 94a that similarly diverge with respect to one another in order to effectively guide and uniformly distribute the shot pellets in a vertical direction. In FIG. 9b there is shown the bottom wall 91b which has thereon the ridges 94b disposed in diverging manner also. The side walls 92b also diverge at the same or at a different rate than the upper and lower walls 91a and 93a of FIG. 9a. The effect of the ridges 94b on the lateral distribution of shot is to uniformly distribute the shot in the expanded manner originally influenced by the side walls 92b. As shown in FIG. 9c the enlarged shot pattern is effectively created by a plurality of divergent walls 91a, 93a, 92b in both the vertical and horizontal planes. The vertical or lateral dimension of the shot pattern can be varied by simply changing the rate of divergence of the walls and ridges in one plane with respect to the walls and ridges in another plane in much the same manner of the converging walls in FIGS. 5 and 6.

In operation, when a shell is fired from the embodiment of FIGS. 1 through 6, the spherical pellets contact the sloping sides of the diverter and are vertically concentrated in an inward direction towards the horizontal plane in which the central axis lies. At the same time, the shot is compressed outwardly when viewed in the horizontal plane (FIG. 6), this despite the fact that the sides 59, 57 converge from rear to front. There can, for example, be produced a uniformly distributed pattern of shot within a 2-foot high by 15-foot wide rectangle at 30 yards, compared to a conventional circular pattern of 2 feet or less. The shell wad, even when of the relatively dense and heavy military type, passes through the reduced mouth area without damaging the shotgun due to the substantial and effective gas pressure relief provided by the apertures in the cage member 3.

It will be recognized that numerous and various forms of the present invention other even than those of FIGS. 7a through 9c may be made without departing from the spirit and scope thereof. For example, as previously mentioned, any number of shot diverting ridges could be utilized in accordance with an intended pattern and it is anticipated that the ridges and walls shall be engineered to accomplish any desired pattern and distribution of the shot therein. Also, it will now more readily be recognized that the explanations and teachings pertaining to the diverter device are, as explained in the Abstract and Background Of The Invention herein, applicable to many diverse applications ranging from, but not limited to, shotgun shells to projectile emitting nozzles.

Therefore, what is claimed and desired to be secured by United States Letters Patent is:

1. An elongate shot diverter having a central longitudinal axis for use with a shotgun comprising:

an elongate tubular body having a shot entry end of generally circular cross-sectional configuration, an exit end, and a plurality of discrete wall means extending between the entry end and exit end, said wall means including upper and lower wall means and side wall means, each of said discrete side wall means and said discrete upper and lower wall means being disposed with respect to one another so as to produce a predetermined pattern of shot on a remote target, and,

ridge means on said wall means, certain of said ridge means being angularly oriented with respect to said central longitudinal axis and to certain of the wall means to provide a shot-diverting and guiding surface which selectively influences the direction of shot movement as it traverses

said elongate tubular body, thereby preventing shot distortion and hence unstable aerodynamic shot movement, thus enhancing direction accuracy and uniformity of shot distribution.

2. The shot diverter of claim 1 wherein the respective side wall means converge from rear to front so as to exert a concentrating effect on the shot and, said upper and lower wall means also being disposed in converging manner so as to concentrate the shot.
3. The shot diverter of claim 1 wherein said upper and lower wall means diverge with respect to one another and said side wall means diverge with respect to one another.
4. The shot diverter of claim 1 wherein said side wall means diverge with respect to one another and said upper and lower wall means converge with respect to one another.
5. The shot diverter of claim 1 wherein said upper and lower wall means diverge with respect to one another and said side wall means converge with respect to one another.
6. The shot diverter of claim 1 wherein said upper and lower wall means and side wall means each include a plurality of discrete semicircular walls, each wall being defined at either longitudinal side thereof by one of said ridge means.
7. The shot diverter of claim 1 wherein said ridge means are most pronounced at the exit end and become proportionately less pronounced per unit of length towards the entry end, thereby gradually sloping downwardly from the exit to the entry end so as to substantially merge into the surface of said wall means proximate the entry end, and thereby providing for gradual but positive alignment of selective shot pellets into predetermined directions.
8. The shot diverter of claim 7 wherein the respective side wall means converge from rear to front so as to exert a concentrating effect on the shot and, said upper and lower wall means also being disposed in converging manner so as to concentrate the shot.
9. The shot diverter of claim 7 wherein said upper and lower wall means diverge with respect to one another and said side wall means diverge with respect to one another.
10. The shot diverter of claim 7 wherein said side wall means diverge with respect to one another and said upper and lower wall means converge with respect to one another.
11. The shot diverter of claim 7 wherein said upper and lower wall means diverge with respect to one another and said side wall means converge with respect to one another.
12. The shot diverter of claim 6 wherein said ridge means are most pronounced at the exit end and become proportionately less pronounced per unit of length towards the entry end, thereby gradually sloping downwardly from the exit to the entry end so as to substantially merge into the surface of said wall means proximate the entry end, and thereby providing for gradual but positive alignment of selective shot pellets

into predetermined directions.

13. The shot diverter of claim 12 wherein the respective side wall means converge from rear to front so as to exert a concentrating effect on the shot and,

said upper and lower wall means also being disposed in converging manner so as to concentrate the shot.

14. The shot diverter of claim 12 wherein said upper and lower wall means diverge with respect to one another and said side wall means diverge with respect to one another.

15. The shot diverter of claim 12 wherein said side wall means diverge with respect to one another and said upper and lower wall means converge with respect to one another.

16. The shot diverter of claim 12 wherein said upper and lower wall means diverge with respect to one another and said side wall means converge with respect to one another.

17. The diverter of claim 1 wherein said elongate tubular body further includes, adjacent the entry end thereof, means for suppressing flash and noise upon firing of the shotgun.

18. The diverter of claim 17 wherein said means for suppressing noise includes a plurality of apertures defined by longitudinal and lateral walls, the intersection of said longitudinal and lateral walls being characterized by fillet means for creating areas of turbulent gas flow, thereby reducing the pitch of audio waves omitted through said apertures.

19. The diverter of claim 18 wherein said lateral walls extend around a major portion of the perimeter of said tubular body and are substantially equidistant from each other and,

each of said longitudinal walls are of substantially the same length as said lateral walls to thereby provide a plurality of equidistantly spaced apertures which exposes a major portion of the tube interior to the atmosphere so as to permit the total reflection of soft gasses back over the apertures in covering relation thereto as a shell wad passes down the tubular body, thereby elevating the pressure of hard gasses in the tube in order to enhance ignition in the bore and thus eliminating visible flash.

20. The shot diverter of claim 6 wherein the respective side wall means converge from rear to front so as to exert a concentrating effect on the shot and,

said upper and lower wall means also being disposed in converging manner so as to concentrate the shot.

21. The shot diverter of claim 6 wherein said upper and lower wall means diverge with respect to one another and said side wall means diverge with respect to one another.

22. The shot diverter of claim 6 wherein said side wall means diverge with respect to one another and said upper and lower wall means converge with respect to one another.

23. The shot diverter of claim 6 wherein said upper and lower wall means diverge with respect to one another and said side wall means converge with respect to one another.

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