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(54) Title: RETRACTABLE LEASH WITH AUTOMATIC BRAKING MECHANISM

(57) **Abstract**: One example embodiment includes a retractable leash for restraining an animal attached to the retractable leash. The retractable leash includes a housing, where the housing is configured to substantially cover the other parts of the retractable leash. The retractable leash also includes a spool in the housing and a leash. The leash is wound around the spool and at least a portion of the leash can be extracted from the housing. The retractable leash further includes an automatic brake, where the automatic brake is configured to lock the leash and prevent further extraction of the leash from the housing if the leash is extracted above a threshold speed.

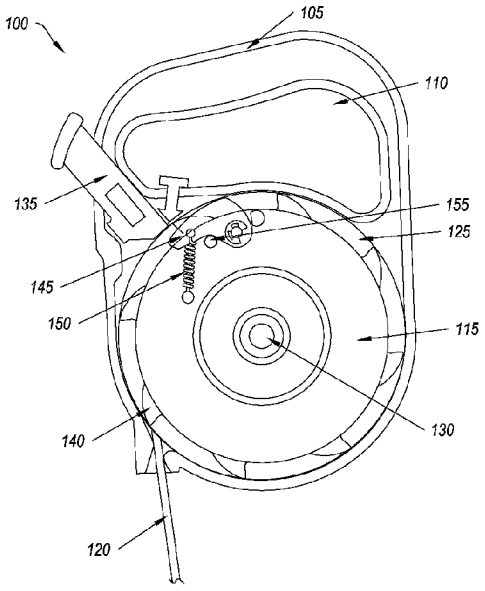

FIG. 1

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RETRACTABLE LEASH WITH AUTOMATIC BRAKING MECHANISM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of and priority to U.S. Non-Provisional Patent Application Serial No. 12/891,615 filed on September 27, 2010, which application is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] A favorite hobby of many pet owners is going for walks with their pet. For example, many dog and cat owners will often take their pet for a walk every day or almost every day. Unfortunately, this can lead to undesirable encounters. For example, pets can attack other animals or people. In addition, pets can become distracted and run away or run into the street where they can be hit and killed. Because of these dangers, many states and cities now have ordinances requiring pets to be on a leash when outdoors.

[0003] A particularly popular type of leash among pet owners is a retractable leash. A retractable leash can allow the pet owner to vary the distance that the pet can be from the owner at any given time. In particular, the owner can allow the pet to wander farther away when it is safe to do so and keep the pet closer when it would be unsafe for the pet to wander.

[0004] Retractable leashes often let out leash unless a brake is applied. That is, the default is that as the pet walks farther away, the retractable leash lengthens to accommodate the pet unless it is set to not let out any more leash. This can increase the danger for the pet and the pet owner. For example, if the owner sees danger, such as a car or another pet, the pet can continue to walk.

[0005] In addition, there is a danger if the pet begins to run away. By the time the pet owner has a chance to apply a brake, the pet may already have momentum away from the pet owner. That is, by the time the pet owner reacts to the pet running away, the pet may already be at a high rate of speed. If the pet owner then applies a brake or the leash reaches the full length all of the momentum acts as a force on the pet owner, pulling him or her in the direction of the running pet.

[0006] This can lead to discomfort or injury for the pet owner. For example, it can pull on the pet owner's arm or can pull the pet owner off his or her feet. The pet owner then has to try to prevent injury while simultaneously trying to regain control of the pet. In particular, the pet owner might continue to have a pet pulling them in one direction while simultaneously attempting to break his or her fall.

[0007] This can also lead to discomfort or injury to the pet. In particular, many leashes are attached to a pet via a collar. A collar is a piece of material placed around the pet's neck. This means that as the pet reaches the end of the leash or the owner applies the leash brake, the force applied by the owner to stop the pet's momentum is applied to the pet's neck which can cause injury to the pet's windpipe or vertebrae.

[0008] Accordingly, there is a need in the art for a leash that includes an automatic brake. Additionally, there is a need for the automatic brake to be applied quickly, before the pet has a chance to build up momentum.

BRIEF SUMMARY OF SOME EXAMPLE EMBODIMENTS

[0009] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential characteristics of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

[0010] One example embodiment includes a retractable leash for restraining an animal attached to the retractable leash. The retractable leash includes a housing, where the housing is configured to substantially cover the other parts of the retractable leash. The retractable leash also includes a spool in the housing and a leash. The leash is wound around the spool and at least a portion of the leash can be extracted from the housing. The retractable leash further includes an automatic brake, where the automatic brake is configured to lock the leash and prevent further extraction of the leash from the housing if the leash is extracted above a threshold speed.

[0011] Another example embodiment includes a retractable leash for restraining an animal attached to the retractable leash. The retractable leash includes a housing and a spool in the housing. The retractable leash also includes a leash, where the leash is wound around the spool and at least a portion of the leash can be extracted from the housing. The retractable leash further includes an automatic braking means, where the automatic braking means is configured to lock the leash and prevent further extraction of the leash from the housing if the leash is extracted at high speed.

[0012] These and other objects and features of the present invention will become more fully apparent from the following description and appended claims, or may be learned by the practice of the invention as set forth hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] To further clarify various aspects of some example embodiments of the present invention, a more particular description of the invention will be rendered by reference to specific embodiments thereof which are illustrated in the appended drawings. It is appreciated that these drawings depict only illustrated embodiments of the invention and are therefore not to be considered limiting of its scope. The invention will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

[0014] Figure 1 illustrates an example of a retractable leash;

[0015] Figure 2 illustrates an example of a retractable leash in which an automatic brake has been applied;

[0016] Figure 3 illustrates an alternative implementation of a retractable leash; and

[0017] Figure 4 illustrates an alternative implementation of a retractable leash.

DETAILED DESCRIPTION OF SOME EXAMPLE EMBODIMENTS

[0018] Reference will now be made to the figures wherein like structures will be provided with like reference designations. It is understood that the figures are diagrammatic and schematic representations of some embodiments of the invention, and are not limiting of the present invention, nor are they necessarily drawn to scale.

[0019] Figure 1 illustrates an example of a retractable leash 100. In at least one implementation, a leash (also called a lead or lead line) is a rope or similar material attached to the neck, head or body of an animal for restraint or control. On the animal, some leashes clip or tie to a collar, harness, or halter, while others go directly around the animal's neck. In at least one implementation, the length of the retractable leash 100 can be adjusted by a user as necessary to keep the animal as close as desired by the user.

[0020] Figure 1 shows that the retractable leash 100 can include a housing 105. In at least one implementation, the housing can substantially enclose the other parts of the retractable leash 100. As used in the specification and the claims, substantially enclose shall mean that the housing 105 surrounds the other parts of the retractable leash 100 except for those parts that need to be exposed to allow the retractable leash 100 to operate in a normal manner, unless otherwise specified. That is, the housing 105 can be configured to keep the various parts of the retractable leash 100 together. I.e., the housing 105 can be configured to ensure that the other parts of the retractable leash 100 remain in the desired position to allow the parts to perform their desired functions. Additionally or alternatively, the housing 105 can be used to protect the parts from damage.

[0021] Figure 1 also shows that the retractable leash 100 can include a handle 110. In at least one implementation, the handle 110 can allow a user to hold the

retractable leash 100. That is, the handle 110 can allow a user to use the retractable leash 100 to control an animal.

[0022] Figure 1 further shows that the retractable leash 100 can include a spool 115. In at least one implementation, the spool 115 includes a cylinder or spindle. In particular, the spool 115 can be circular in shape in order to allow easy winding and unwinding. That is, the spool 115 can be rotated, which will wind or unwind the spool, as discussed below.

[0023] Figure 1 additionally shows that the retractable leash 100 can include a leash 120. The leash 120 can include any material which allows the retractable leash 100 to control an animal as desired by the user. In particular, the leash 120 can be made of any material which can withstand the force of the user and the animal pulling against one another. For example, the leash 120 can be made of metal, leather, braided leather, nylon cord, nylon webbing or any other suitable material.

[0024] Figure 1 also shows that the leash 120 can extend from the housing 105. In at least implementation, the leash 120 can be extracted to any length desired, up to a maximum length, that allows the user to maintain control of the animal. In particular, the end of the leash 120 can include a clip that can be connected to a collar or harness placed on the animal. The leash 120 can be of the maximum length at which a user would feel comfortable controlling the animal. For example, if the user wishes to allow the animal to be between 15 and 25 feet away, the leash 120 can be 25 feet long.

[0025] Figure 1 further shows that the leash 120 can be attached to and wound around the spool 115. In at least one implementation, the leash 120 wound around the spool 115 can allow the user to vary the length of the leash 120 which extends from the housing 105. That is, winding more of the leash 120 around

spool 115 allows the leash 120 to extend a shorter distance from the housing 105. In contrast, winding less of the leash 120 around the spool 115 allows the leash 120 to extend a longer distance from the housing 105.

[0026] Figure 1 additionally shows that the spool 115 can include a flange 125. In at least one implementation, the flange 125 can prevent the leash 120 from slipping off the spool 115. That is, as the leash 120 is wound around the outer surface of the spool 115, the flange 125 can prevent the leash 120 from slipping off of the outer surface. Additionally or alternatively, the housing 105 can fit tightly around the spool 115 preventing any slippage of the leash 120 relative to the spool 115.

[0027] Figure 1 also shows that the spool 115 can include a central portion 130. In at least one implementation, the central portion 130 allows the spool 115 to rotate. In particular, the central portion 130 can hold the central point of the spool 115 in one location relative to the housing 105. That is, the central portion 130 holds the central point of the spool 115 immobile, except for rotational movement, within the housing 105.

[0028] In at least one implementation, the spool 115 also can include a recoil spring. In at least one implementation, the recoil spring is configured to move the spool 115 back to its original position when the spool 115 has moved. That is, the recoil spring retains rotation energy when the leash 120 extends from the housing 105. When the leash 120 is released, the spring releases the rotational energy, causing the spool 115 to rotate and the leash 120 to wind around the spool 115.

[0029] Figure 1 further shows that the retractable leash 100 can include a manual brake 135. In at least one implementation, the manual brake 135 can be used to prevent the spool 115 from rotating. In particular, the manual brake 135 can be pushed by a user to contact the spool 115. As the manual brake 135

comes in contact with the spool 115, the spool 115 is prevented from rotating. For example, the spool 115 can include one or more tabs 140. When the manual brake 135 is engaged, rotation of the spool 115 causes the one or more tabs 140 to come in contact with the manual brake 135, which prevents rotation of the spool 115.

[0030] In at least one implementation, the manual brake 135 can include a thumb brake. That is, the manual brake 135 is configured to be near the user's thumb when the user is holding the handle 105 of the retractable leash 100. A thumb brake can allow the user to maintain his or her grip on the handle 105 while simultaneously engaging the manual brake 135. This is, the user can engage the manual brake 135 without loosening his or her grip on the handle 105.

[0031] In at least one implementation, the manual brake 135 can include a lock. In particular, the lock can be configured to keep the manual brake engaged until disengaged by a user. That is, the lock can allow the user to prevent rotation of the spool 115 without needing to continue to push on the manual brake 135.

[0032] Figure 1 additionally shows that the retractable leash 100 can include a cam 145. In at least one implementation, the cam 145 can include a disk or cylinder having an irregular form. That is, cam 145 can be shaped such that the diameter varies in different directions. A varying diameter can allow rotation of the cam 145 to bring the cam 145 into contact with, or avoid contact with, other objects depending on the orientation of the cam 145. For example, the cam 145 can be substantially L shaped. That is, the cam 145 can include a first portion and a second portion that is perpendicular, or approximately perpendicular, to the first portion.

[0033] Figure 1 also shows that the cam 145 can be attached to the spool 115. In at least one implementation, attaching the cam 145 to the spool 115 can allow

the cam 145 to automatically stop the spool 115 from rotating faster than a certain rotational speed. That is, if the leash 120 is extracted from the housing 105 at a high rate of speed, the spool 115 will rotate quickly enough that the cam 145 will prevent further motion of the spool 115, as discussed below.

[0034] Figure 1 further shows that the retractable leash 100 can include a retaining spring 150 attached to the cam 145. In at least one implementation, the retaining spring 150 is configured to pull the cam 145 toward the central portion 130 of the spool 115. That is, the retaining spring 150 can be used to ensure that the cam 145 does not come into contact with the housing 105 when the spool 115 is stationary or at low rotational speeds.

[0035] Figure 1 additionally shows that the retractable leash 100 can include a stop 155. In at least one implementation, the stop 155 prevents the cam 145 from moving too far toward the central portion 130 of the spool 115. In particular, the stop 155 can prevent the retaining spring 150 from fully relaxing which keeps the cam 145 firmly against the stop 155.

[0036] Figure 2 illustrates an example of a retractable leash 100 in which an automatic brake has been applied. In at least one implementation, an automatic brake can stop the leash 120 from being extracted from the housing 105 if the leash 120 begins to be extracted too quickly. For example, if the leash 120 is connected to an animal that begins to run away, the automatic brake can stop the leash 120 from being extracted from the housing 105. Additionally or alternatively, the automatic brake can stop the leash 120 from being extracted from the housing 105 if the user stops and the animal continues to move away from the user.

[0037] Figure 2 shows that the retractable leash 100 can include a catch 205. In at least one implementation, the catch 205 is configured to catch the cam 145. That is, if the centrifugal force from the spinning of the spool 115 is sufficient, the

cam 145 will be pushed away from the center portion 130 and pull on the retaining spring 150. When the centrifugal force is sufficient, the cam will try to push beyond the outer circumference of the spool 115. For most of the outer circumference, the housing will prevent the cam 145 from pushing out too far. However, when the cam 145 reaches the catch 205 the cam 145 will enter the catch 205. The cam 145 is then stopped by the catch 205, which in turn can stop the spool 115 which is attached to the cam 145.

[0038] In at least one implementation, the catch 205 can include a portion of the housing 105. That is, the catch 205 can include a portion of the housing 105 where the housing 105 is further from the spool 115 than other portions of the housing 105. Additionally or alternatively, the catch 205 can include a portion of the manual brake 135 or any other mechanism that is configured to catch the cam 145 and prevent it from moving.

[0039] In at least one implementation, the rotational speed of the spool 115 necessary for the cam 145 to act against the retaining spring 150 and therefore move towards the outer circumference of the spool 115 is determined by the placement of the cam 145 relative to the outer edge of the spool 115, the type and placement of the retaining spring 150 and the mass of the cam 145. For example, the cam 145 can be configured to enter the catch 205 when the leash is being extracted at between 1 foot per second (fps) and 2 fps. In particular, the cam 145 can be configured to enter the catch 205 at approximately 1.5 fps. As used in the specification and the claims, the term approximately shall mean that the value is within 10% of the stated value, unless otherwise specified.

[0040] In at least one implementation, the catch 205 can include a switch 207 which allows the user to prevent the cam 145 from entering the catch 205 if desired. For example, the switch 207 can prevent the cam 145 from rotating

relative to the spool 115. Additionally or alternatively, the switch 207 can prevent the cam 145 from entering the catch 205. For example, the switch 207 can include a section of housing 105 which is movable and can be used to prevent the cam 145 from entering the catch 205.

[0041] Figure 2 also shows that the retractable leash 100 can include a backstop 210. In at least one implementation, the backstop 210 can prevent further rotation of the cam 145. That is, the cam 145 will enter the catch 205 and the force of the cam 145 striking the catch 205 will tend to rotate the cam 145. The backstop 210 can prevent the cam 145 from rotating too far and exiting the catch 205 without stopping the spool 115.

[0042] In at least one implementation, the backstop 210 can also help stop the spool 115 from rotating. In particular, the backstop 210 can provide a force point where the spool 115 strikes the cam 145 if the cam 145 has entered the catch 205. This can help ensure that the forces involved in stopping the spool 115 do not break the spool 115 or the cam 145.

[0043] In at least one implementation, the retractable leash 100 can include a cam 145 on either side of the spool 115. In particular, a second cam 145 can be opposite the cam 145. The cam 145 and a second cam can work with one another to stop the spool 115 from rotating. For example, the cam 145 and a second cam can be connected to one another through an axle which extends through the spool 115. As the spool 115 rotates rapidly the centrifugal force on the cam 145 and the second cam can be equalized such that both or neither enter the catch 205 depending on the speed of rotation. A second cam and a second backstop can further reduce the force on the spool 115 as the cam 145 is stopped by the catch 205.

[0044] Figure 3 illustrates an alternative implementation of a retractable leash 300. In at least one implementation, the retractable leash 300 can include an automatic braking system. In particular, the automatic braking system can stop the leash 120 from exiting the housing 105. I.e., as the animal begins to move away from the user at a high rate of speed, the automatic braking system can prevent the animal from attaining a high speed.

[0045] Figure 3 shows that the retractable leash 300 can include a lever 305. In at least one implementation, the lever 305 can include a rigid object that can rotate about a fulcrum 310. In particular, the lever 305 can either multiply the mechanical force that can be applied to another object or resistance force, or multiply the distance and speed at which the opposite end of the lever 305 travels. I.e., a small amount of movement on one end of the lever 305 can be translated into a larger amount of movement at the opposite end of the lever 305.

[0046] Figure 3 also shows that the retractable leash 300 can include a cam 145 attached to a spool 115. In at least one implementation, attaching the cam 145 to the spool 115 can allow the cam 145 to automatically stop the spool 115 from rotating faster than a certain rotational speed. That is, if the leash 120 is extracted from the housing 105 at a high rate of speed, the spool 115 will rotate quickly enough that the cam 145 will prevent further motion of the spool 115, as discussed below.

[0047] Figure 3 further shows that the retractable leash 300 can include a retaining spring 150 attached to the cam 145. In at least one implementation, the retaining spring 150 is configured to pull the cam 145 toward the central portion 130 of the spool 115. That is, the retaining spring 150 can be used to ensure that the cam 145 does not come into contact with the lever 305 when the spool 115 is stationary or at low rotational speeds.

[0048] Figure 3 additionally shows that as the spool 115 rotates at a high rate of speed, the cam 145 moves outward, making contact with the lever 305. The lever 305, in turn, makes contact with the manual brake 135. As the speed exceeds a threshold limit, the cam 145 provides a sufficient amount of force on the first end of the lever 305 to move the manual brake 135 into position, stopping the rotation of the spool 115. For example, the cam 145 can be configured to provide sufficient force to the lever 305 to engage the manual brake 135 when the leash is being extracted at between 1 foot per second (fps) and 2 fps. In particular, the cam 145 can be configured to provide sufficient force to the lever 305 to engage the manual brake 135 when the leash is being extracted at approximately 1.5 fps. The user can then, if desired, put pressure on the manual brake 135 preventing further rotation of the spool 115.

[0049] In at least one implementation, the retractable leash 300 can include a switch 315 which allows the user to prevent lever 305 from engaging the manual brake 135, if desired. For example, the switch 315 can prevent the cam 145 from rotating relative to the spool 115. Additionally or alternatively, the switch 315 can prevent the lever 305 from rotating about the fulcrum 310. For example, the switch 315 can include a section of housing 105 which is movable and can be used to prevent the lever 305 from rotating about the fulcrum 310.

[0050] Figure 4 illustrates an alternative implementation of a retractable leash 400. In at least one implementation, the retractable leash 400 can include an automatic braking system. In particular, the automatic braking system can stop the leash 120 from exiting the housing 105. I.e., as the animal begins to move away from the user at a high rate of speed, the automatic braking system can prevent the animal from attaining a high speed.

[0051] Figure 4 shows that the retractable leash 400 can include a sliding member 405. In at least one implementation, the sliding member 405 can be attached to the spool 115. Attaching sliding member 405 to the spool 115 can allow the sliding member 405 to automatically stop the spool 115 from rotating faster than a certain rotational speed. That is, if the leash 120 is extracted from the housing 105 at a high rate of speed, the spool 115 will rotate quickly enough that the sliding member 405 will prevent further motion of the spool 115, as discussed below.

[0052] Figure 4 also shows that the retractable leash 400 can include a guide 410. In at least one implementation, the guide 410 can control the motion of the sliding member 405. I.e., the guide 410 can ensure that the sliding member 405 moves only in a desired direction based on the rotational speed of the spool 115. In particular, the rotational motion of the spool 115 would cause the sliding member 405 to rotate in the absence of the guide 410.

[0053] Figure 4 further shows that the retractable leash 400 can include a retaining spring 150 attached to the sliding member 405. In at least one implementation, the retaining spring 150 is configured to pull the sliding member 405 toward the central portion 130 of the spool 115. That is, the retaining spring 150 can be used to ensure that the sliding member 405 does not come into contact with the housing 105 when the spool 115 is stationary or at low rotational speeds.

[0054] Figure 4 additionally shows that the retractable leash 400 can include a block 415. In at least one implementation, the block 415 prevents the sliding member 405 from moving too far toward the central portion 130 of the spool 115. In particular, the block 415 can prevent the retaining spring 150 from fully relaxing which keeps the sliding member 405 firmly against the block 415.

[0055] Figure 4 also shows that the retractable leash 400 can include a housing stop 420. In at least one implementation, the housing stop 420 is configured to catch the sliding member 405. That is, if the centrifugal force from the spinning of the spool 115 is sufficient, the sliding member 405 will be pushed away from the center portion 130 and pull on the retaining spring 150. When the centrifugal force is sufficient, the sliding member 405 will try to push beyond the outer circumference of the spool 115. For most of the outer circumference, the housing will prevent the sliding member 405 from pushing out too far. However, when the sliding member 405 reaches the housing stop 420 the sliding member 405 will make contact with the housing stop 420. The sliding member 405 is then stopped by the housing stop 420, which in turn can stop the spool 115 which is attached to the sliding member 405.

[0056] In at least one implementation, the housing stop 420 can include a portion of the housing 105. That is, the housing stop 420 can include a portion of the housing 105 where the housing 105 is further from the spool 115 than other portions of the housing 105. Additionally or alternatively, the housing stop 420 can include a portion of the manual brake 135 or any other mechanism that is configured to catch the sliding member 405 and prevent it from moving.

[0057] In at least one implementation, the rotational speed of the spool 115 necessary for the sliding member 405 to act against the retaining spring 150 and therefore move towards the outer circumference of the spool 115 is determined by the placement of the sliding member 405 relative to the outer edge of the spool 115, the type and placement of the retaining spring 150 and the mass of the sliding member 405. For example, the sliding member 405 can be configured to enter the housing stop 420 when the leash is being extracted at between 1 foot

per second (fps) and 2 fps. In particular, the sliding member 405 can be configured to enter the housing stop 420 at approximately 1.5 fps.

[0058] In at least one implementation, the housing stop 420 can include a switch 425 which allows the user to prevent the sliding member 405 from entering the housing stop 420 if desired. For example, the switch 425 can prevent the sliding member 405 from rotating relative to the spool 115. Additionally or alternatively, the switch 425 can prevent the sliding member 405 from entering the housing stop 420. For example, the switch 425 can include a section of housing 105 which is movable and can be used to prevent the sliding member 405 from entering the housing stop 420.

[0059] The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

CLAIMS

What is claimed is:

1. A retractable leash for restraining an animal attached to the retractable leash, the retractable leash comprising:

a housing, wherein the housing is configured to substantially cover the other parts of the retractable leash;

a spool in the housing;

a leash, wherein the leash is wound around the spool and at least a portion of the leash can be extracted from the housing; and

an automatic brake, wherein the automatic brake is configured to lock the leash and prevent further extraction of the leash from the housing if the leash is extracted above a threshold speed.

2. The retractable leash of claim 1 further comprising a manual brake, wherein the manual brake is configured to prevent rotation of the spool when engaged by a user.

3. The retractable leash of claim 2, wherein the automatic brake is configured to engage the manual brake.

4. The retractable leash of claim 3, wherein the automatic brake includes:

a cam, wherein the cam is configured to be forced outward against the housing when the spool rotates above the threshold speed; and

a lever, wherein:

one end of the lever is configured to be moved by the cam when the spool rotates above the threshold speed; and

the other end of the lever engages the manual brake.

5. The retractable leash of claim 1, wherein the automatic brake includes:

a cam, wherein the cam is configured to be forced outward against the housing when the spool rotates above the threshold speed;

a retaining spring, wherein the retaining spring is configured to pull the cam toward the central portion of the spool;

a catch, wherein the catch is configured to prevent the cam from moving, wherein the cam stops the spool from rotating when the cam is prevented from moving; and

a backstop, wherein the backstop prevents the cam from rotating and exiting the catch.

6. The retractable leash of claim 1, wherein the automatic brake includes:

a sliding member, wherein the sliding member is configured to be forced outward against the housing when the spool rotates above a threshold speed;

a retaining spring, wherein the retaining spring is configured to pull the sliding member toward the central portion of the spool when the spool is at rest; and

a housing stop, wherein the housing stop is configured to prevent the sliding member from moving, wherein the sliding member stops the spool from rotating.

7. The retractable leash of claim 1, wherein the threshold speed is between 1 and 2 feet per second.

8. The retractable leash of claim 7, wherein the threshold speed is approximately 1.5 feet per second.

9. The retractable leash of claim 1 further comprising a switch, wherein the switch is configured to allow a user to prevent automatic brake from engaging.

10. The retractable leash of claim 1 further comprising a recoil means, wherein the recoil means is configured to rotate the spool and retract the leash.

11. A retractable leash for restraining an animal attached to the retractable leash, the retractable leash comprising:

a housing, wherein the housing is configured to substantially cover the other parts of the retractable leash;

a spool in the housing;

a leash, wherein the leash is wound around the spool and at least a portion of the leash can extend from the housing; and

an automatic brake, the automatic brake including:

a braking member; and

a catch;

wherein the catch is configured to engage the braking member thereby stopping rotation of the spool if the leash is extracted from the housing above a threshold speed.

12. The retractable leash of claim 11 wherein the catch includes a stop integrally formed with the housing.

13. The retractable leash of claim 11 further comprising:

a cam, wherein the cam is configured to be forced outward against the housing when the spool rotates above the threshold speed.

14. The retractable leash of claim 11 wherein the automatic brake includes:

a lever, wherein the lever is pivotally connected to the housing and includes:

a first end; and

a second end;

a cam, wherein the cam is configured to be forced outward against the housing when the spool rotates above the threshold speed;

wherein the cam is configured to engage the first end of the lever when the leash is extracted above the threshold speed; and

wherein the second end of the lever is configured to engage a second braking member, wherein the second braking member prevents rotation of the spool.

15. The retractable leash of claim 12, wherein the braking member includes:

a sliding member, wherein the sliding member is configured to be forced outward against the housing when the spool rotates above a threshold speed; and

a guide, wherein the guide is configured to direct the path of the sliding member when forced outward against the housing.

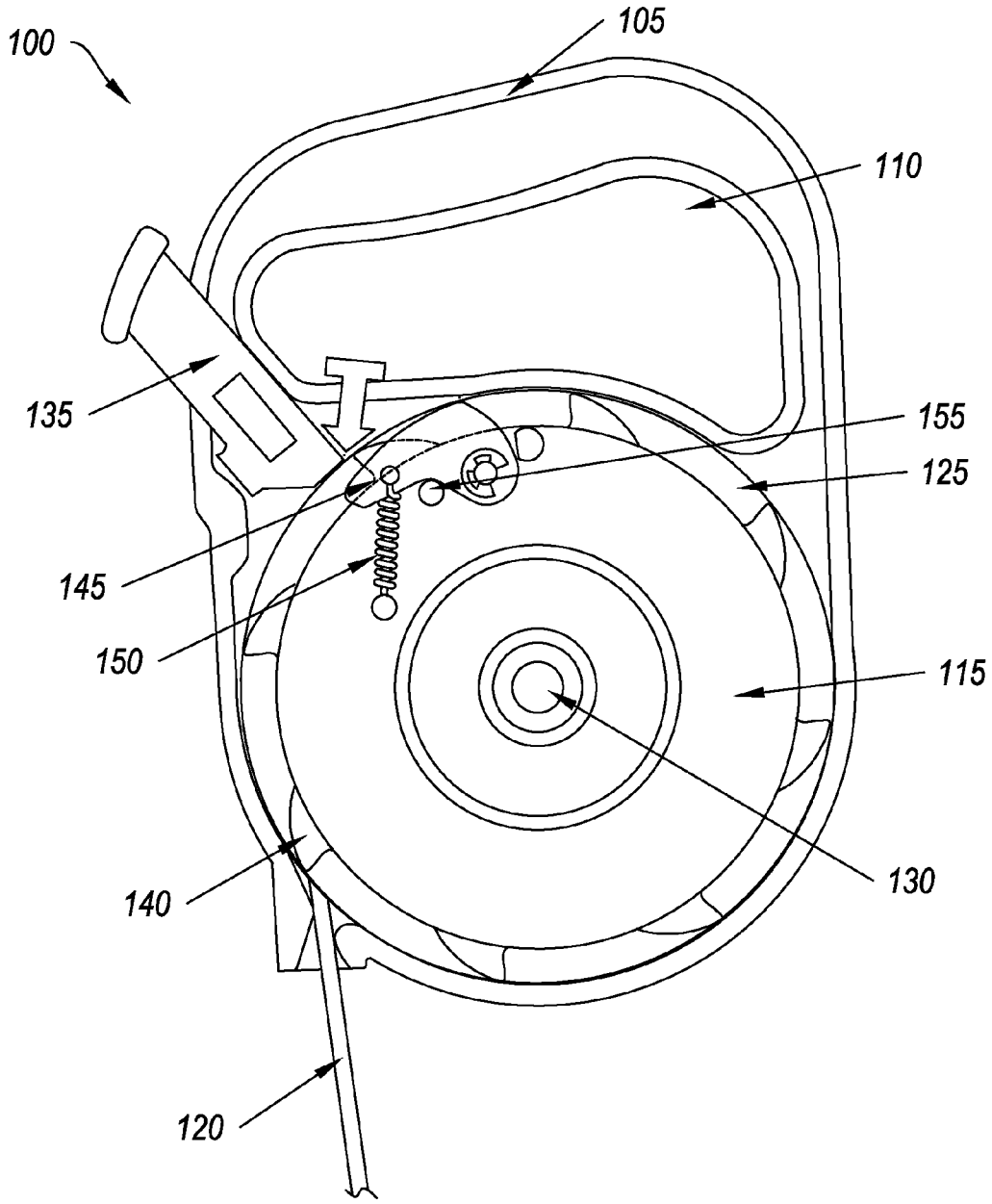

FIG. 1

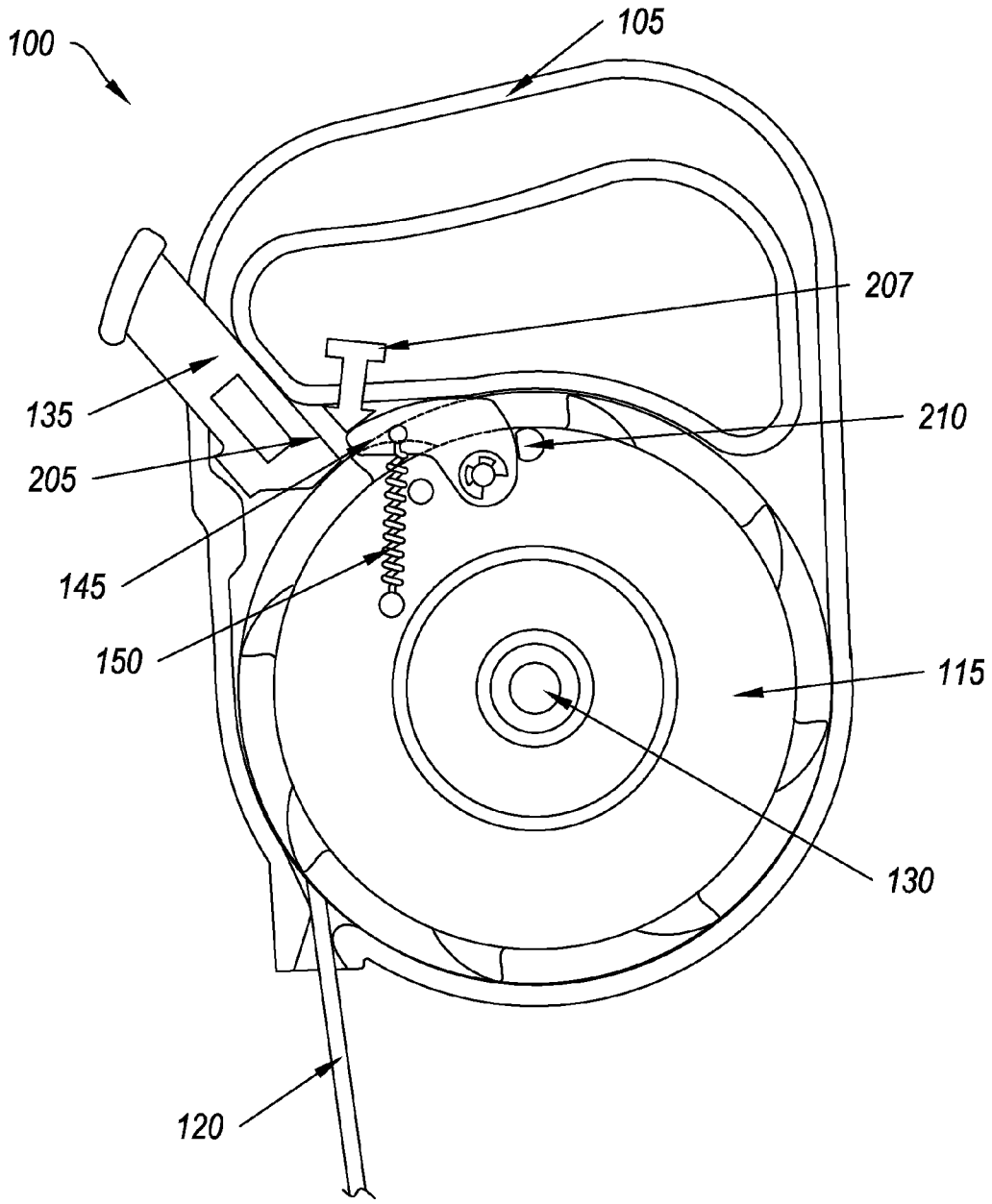

FIG. 2

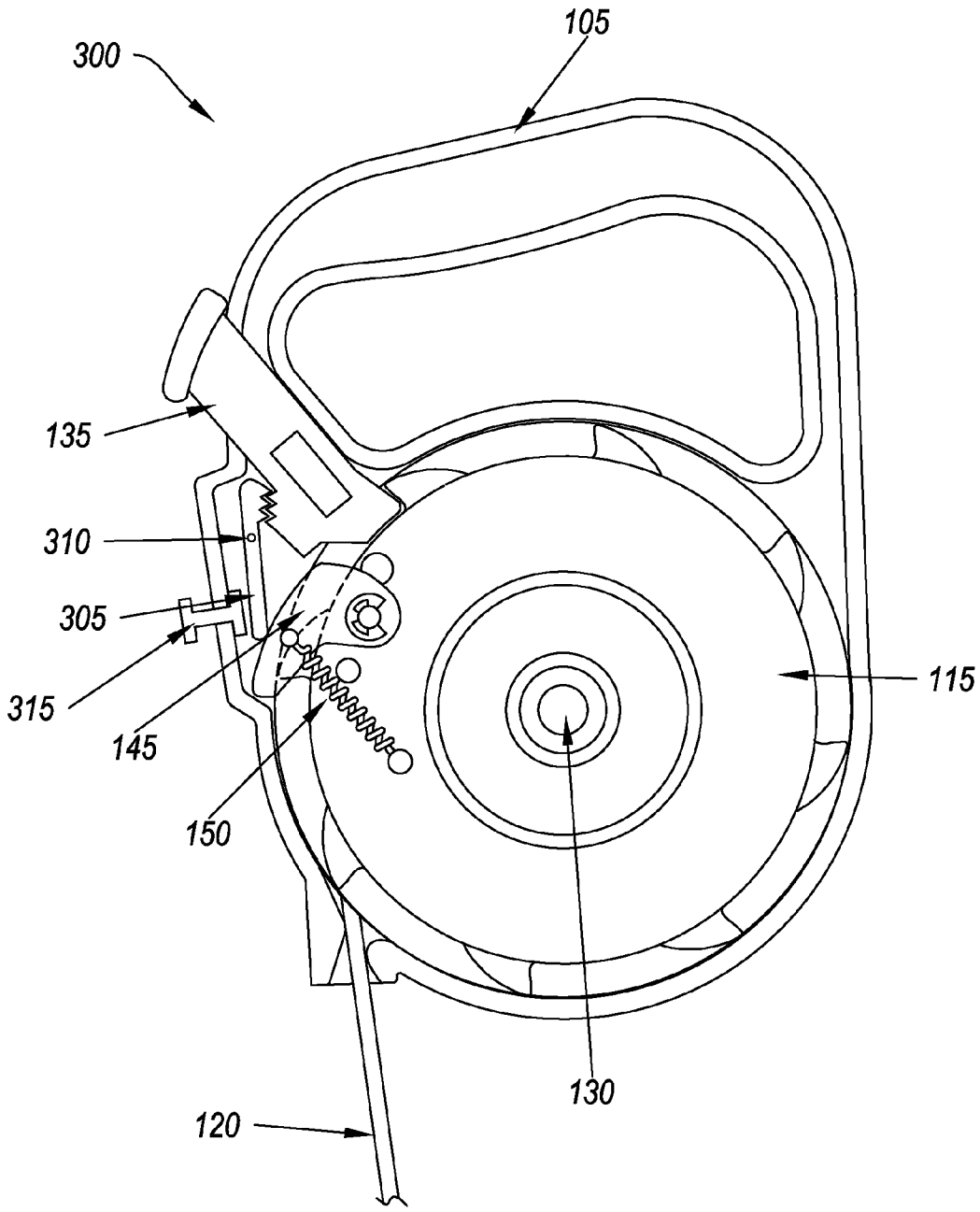

FIG. 3

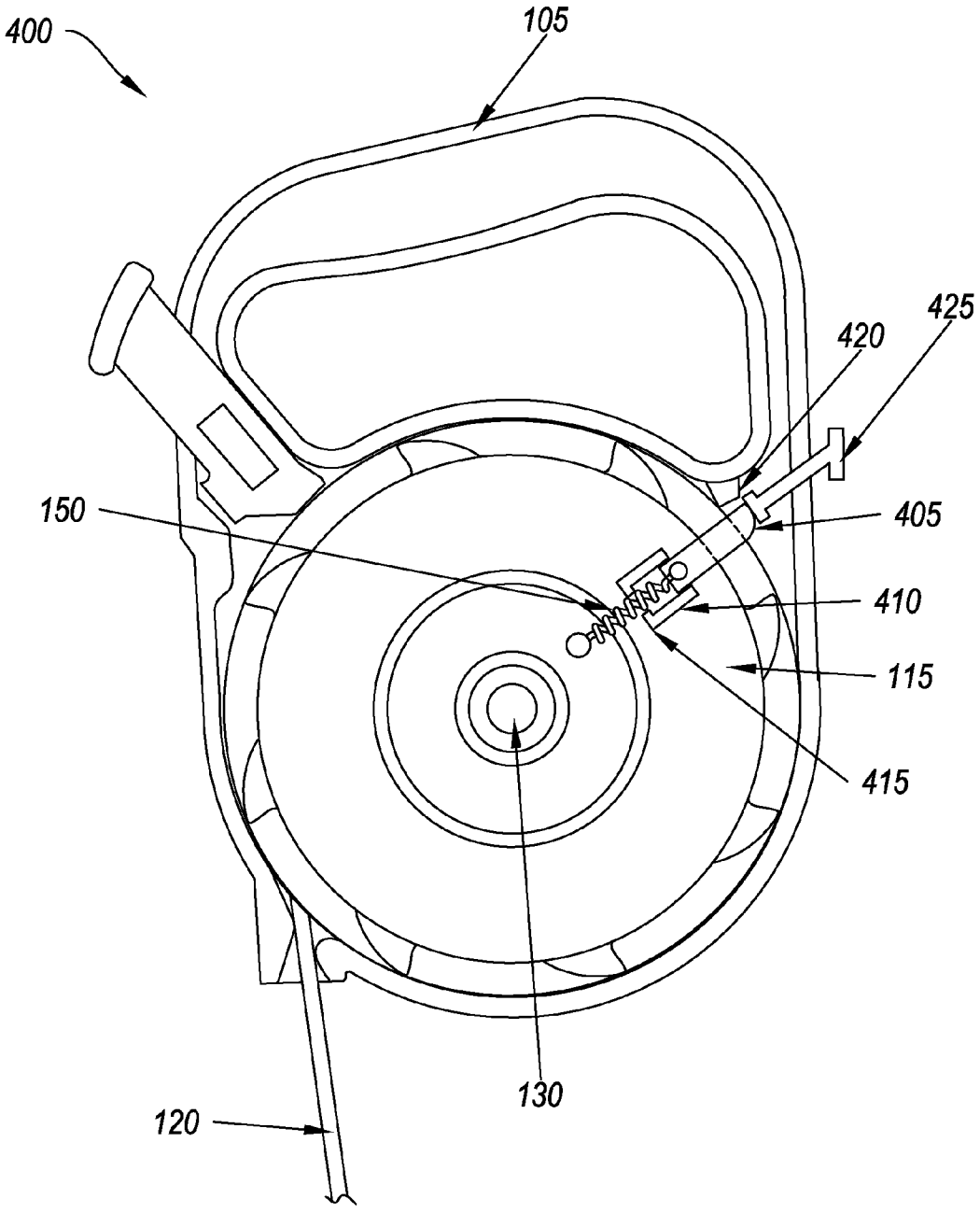

FIG. 4