OBJECT OF THE INVENTION

Embodiments of the present invention seek to overcome and/or alleviate one or more of the above described disadvantages of the prior art or provide the consumer with a useful or commercial choice.

SUMMARY OF THE INVENTION

According to one aspect of the invention, there is provided a wire coil for use in an innerspring, comprising:

a plurality of helical turns that form a helical coil body about a longitudinal axis of the coil, and which helical turns define a helical turn radius;

a first coil end extending from one end of the helical coil body; and

a second coil end extending from an opposite end of the helical coil body;

wherein at least one of the first coil end and the second coil end include one or more touch points defined by both a first portion extending a distance from the longitudinal axis of the coil that is greater than the helical turn radius, a second portion extending a distance from the longitudinal axis of the coil that is less than the helical turn radius, and the at least one first coil end and second coil end each terminating in a loose end that is at a distance from the longitudinal axis that is less than the helical turn radius.

Preferably, the touch points are included on both the first coil end and the second coil end.

Preferably, the touch points are spaced apart around the full circumference of the helical coil body to provide uniform support around the full circumference of the helical coil body. Preferably, the first coil end lies approximately in a plane that is perpendicular to the longitudinal axis of the coil.

Preferably, the second coil end lies approximately in a plane that is perpendicular to the longitudinal axis of the coil.

Preferably, points on the longitudinal axis of the coil are centrally located within the profiles of the two coil ends.

Preferably, the first coil end includes two end segments that are approximately straight.

Preferably, the two end segments are approximately parallel to each other.

Preferably, the two end segments are spaced apart by approximately 180 degrees measured about the longitudinal axis of the coil and around the helical coil body.

Preferably, the first coil end includes two end segments, and the second coil end includes two end segments that overlap the two end segments of the first coil end in a direction parallel to the longitudinal axis of the coil.

Preferably, the coil is formed into an innerspring system using various possible methods including, but not limited to, helical lacing wires, pockets formed from textile material or another method of connecting the coils.

Preferably, an upper portion of the helical coil body includes more closely wound turns than a lower portion of the helical coil body.

Preferably, a spring rate of the wire coil during compression sequentially increases in six stages as each touch point of six different touch points contacts the coil body.

According to another aspect of the invention, there is provided an innerspring system, comprising a plurality of the wire coils described above.

Preferably, the longitudinal axis of each wire coil in the plurality of wire coils is centralized to prevent uneven coil spacing in alternating units of the wire coils.

Preferably, rows or columns of wire coils are turned 180 degrees around their longitudinal axis and relative to other wire coils to improve system stability.

BRIEF DESCRIPTION OF THE DRAWINGS

Claims

1. A wire coil for use in an innerspring, comprising:

a plurality of helical turns that form a helical coil body about a longitudinal axis of the coil, and which helical turns define a helical turn radius;

a first coil end extending from one end of the helical coil body; and

a second coil end extending from an opposite end of the helical coil body;

wherein at least one of the first coil end and the second coil end include one or more touch points defined by both a first portion extending a distance from the longitudinal axis of the coil that is greater than the helical turn radius, a second portion extending a distance from the longitudinal axis of the coil that is less than the helical turn radius, and the at least one first coil end and second coil end each terminating in a loose end that is at a distance from the longitudinal axis that is less than the helical turn radius.

2. The wire coil of claim 1, wherein the touch points are included on both the first coil end and the second coil end.

3. The wire coil of claim 1, wherein the touch points are spaced apart around the full circumference of the helical coil body to provide uniform support around the full circumference of the helical coil body.

4. The wire coil of claim 1, wherein the first coil end lies approximately in a plane that is perpendicular to the longitudinal axis of the coil.

5. The wire coil of claim 1, wherein the second coil end lies approximately in a plane that is perpendicular to the longitudinal axis of the coil.

6. The wire coil of claim 1, wherein points on the longitudinal axis of the coil are centrally located within the profiles of the first coil end and second coil end.

7. The wire coil of claim 1, wherein the first coil end includes two end segments that are approximately straight.

8. The wire coil of claim 7, wherein the two end segments are approximately parallel to each other.

9. The wire coil of claim 7, wherein the two end segments are spaced apart by approximately 180 degrees measured about the longitudinal axis of the coil and around the helical coil body.

10. The wire coil of claim 1, wherein the first coil end includes two end segments, and the second coil end includes two end segments that overlap the two end segments of the first coil end in a direction parallel to the longitudinal axis of the coil.

11. The wire coil of claim 1, wherein, the coil is formed into an innerspring system using one of the following methods: helical lacing wires, pockets formed from textile material or another method of connecting the coils.

12. The wire coil of claim 1, wherein an upper portion of the helical coil body includes more closely wound turns than a lower portion of the helical coil body.

13. The wire coil of claim 12, wherein a spring rate of the wire coil during compression sequentially increases in six stages as each touch point of six different touch points contacts the coil body.

14. An innerspring system, comprising a plurality of the wire coil of claim 1.

15. The innerspring system of claim 14, wherein the longitudinal axis of each wire coil in the plurality of wire coils is centralized to prevent uneven coil spacing in alternating units of the wire coils.

16. The innerspring system of claim 15, where rows or columns of wire coils are turned 180 degrees around their longitudinal axis and relative to other wire coils to improve system stability.