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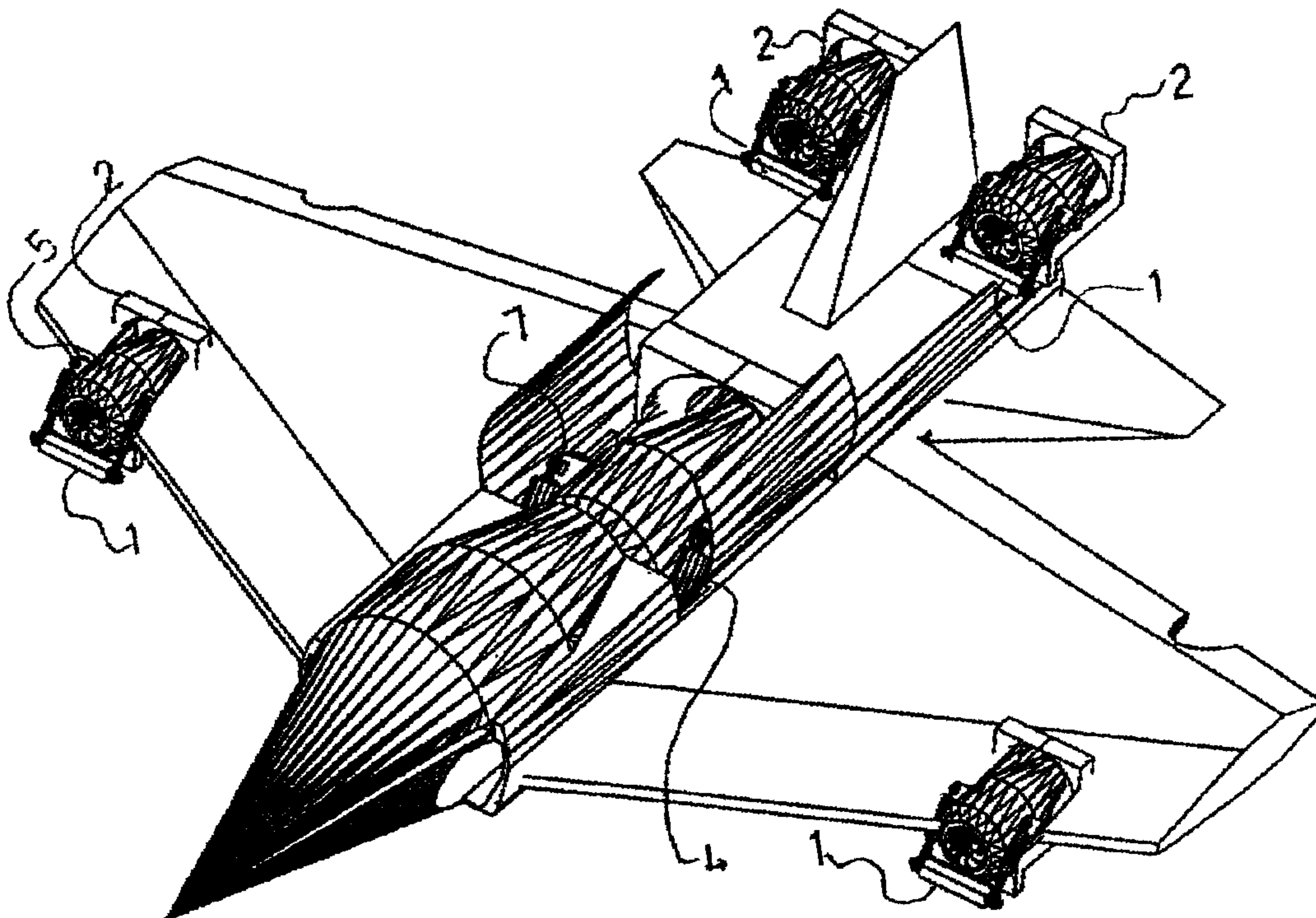
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(54) Title: VERTICAL LIFT AIRCRAFT



(57) Abrégé/Abstract:

A vertical jet aircraft with a tiltable jet engine that is mounted in the aircraft to help the pilot when he or she has his or her landing gear down and has the elevators at the tail plane and the ailerons at the wings set for landing to obtain vertical thrust by using hydraulic lifters to tilt the engine. The aircraft will experience more vertical thrust for every increase in angle as the engine gets tilted from horizontal to vertical. The aircraft will reach 100% vertical thrust, 0% horizontal thrust so the aircraft will gear towards 100% vertical landing or takeoff and also, this tiltable jet engine aircraft will be able to land or takeoff vertically without the thrust provided by the wings.



VERTICAL LIFT AIRCRAFT

ABSTRACT

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provided by the wings.

VERTICAL LIFT AIRCRAFT

5 BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The invention relates to aircraft to do an efficient all-angle landing including the
10 vertical landing and takeoff without the wing thrust before it gets on to its horizontal flying.

Discussion of the Background

[0002] There are vertical lift aircraft with a variety of designs in the market for vertical
15 landings and vertical lifts before horizontal flying, carrying fixed and rotatable jet engines,
some with attachments that are actuated for the jet to do vertical landings and vertical lifts.

[0003] All the aircraft that are equipped with vertical landing and vertical lift systems allow
the pilot to travel vertically and land and take off at all angles.

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SUMMARY

[0004] A Vertical Lift Aircraft according to a preferred embodiment of the invention is

equipped with a jet engine mounted on a swivel system with hydraulic lifters to tilt the engine to a vertical position which allows the aircraft to do efficient landings and takeoffs at all angles including vertically without the thrust provided by the wings.

5 [0005] An advantage of this invention is the principle can be practiced not only on fighter aircraft, but can also be practiced on passenger aircraft for smoother takeoffs and landings.

[0006] Another advantage is that more than one jet engine with the swivel and the hydraulic system can be mounted to the aircraft for better control of vertical landings and takeoffs.

10

[0007] If it is a single jet engine aircraft, the engine has to be mounted close to the center of gravity, but for example if there are six jet engines, four engines can be mounted on the wings, two on either side and two on the tail end. The more engines, the better the control in the horizontal plane when the aircraft is landing or taking off vertically.

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[0008] Another advantage is that the engine is tilted by hydraulic lifters. When the lifters are at zero lift, the aircraft tends to travel horizontally, and when the lifters start tilting the engine from the 180 degree position towards 90 degrees, the aircraft tends to experience vertical thrust. The multi-engined aircraft has more control in the horizontal plane when the jet is on

20 100% vertical thrust or during vertical landing or vertical liftoff

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] A more complete understanding of the present invention may be derived by referring to the detailed description and claims when considered in connection with the figures,
5 wherein like reference numbers and letters refer to similar items throughout the figures.

[0010] FIG. 1 is a right view showing closed engine room doors and hydraulic lifters at zero lift.

10 [0011] FIG. 2 is a right view showing shows open engine room doors and hydraulic lifters at zero lift.

[0012] FIG. 3 is a right view showing open engine room doors, where the hydraulic lifters have started lifting the engine to about approximately thirty degrees.

15

[0013] FIG. 4 is a right view showing open engine room doors, where the hydraulic lifters have tilted the engine to 90 degrees from the jet's horizontal axis.

[0014] FIG. 5. Shows a view of a single engine vertical lift aircraft.

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[0015] FIG. 6. is a view of a five jet engine aircraft according to a preferred embodiment of the invention.

[0016] FIG. 7. shows the housing, the jet engine, the swivel system and the engine hydraulic lifters according to a preferred embodiment of the invention.

5 [0017] FIG. 8. shows a view of the jet engine, the swivel system and the engine hydraulic lifters according to a preferred embodiment of the invention.

[0018] FIG. 9. shows a side view with the jet engine horizontal and shows a cut away view of a piston.

10 [0019] FIG. 10. shows a side view with the jet engine horizontal.

[0020] FIG. 11. shows the jet engine partly tilted.

15 [0021] FIG. 12. is a side view showing the jet engine partly tilted, and shows a cut away view of a piston.

[0022] FIG. 13. is a side view showing the jet engine partly tilted..

DETAILED DESCRIPTION

5 **[0023]** The following numerals are used for elements in the drawings.

1. JET SUBFRAME
2. JET MAINFRAME
3. ENGINE DOOR
4. LIFTER CYLINDER
- 10 5. JET ENGINE
6. MAIN SWIVEL PIN
7. CRANK ARM
8. LIFTER TOP ROD
9. OIL TRAVEL PORT
- 15 10. HIGHER PRESSURE HOSE
11. LIFTER TOP SWIVEL PIN
12. LIFTER BOTTOM ROD
13. LIFTER BOTTOM SWIVEL PIN
14. LIFTER BOTTOM ROD HOUSING
- 20 15. LIFTER PISTON
16. LIFTER PRESSURE CHAMBER

[0024] High-pressure hose (10) is extended to the cockpit where the pilot will be able to

control the pressure in the chamber (16), from the cockpit it self. For instance when the pilot operates the landing gear having the ailerons and elevators set for landing (descending), the pilot could go from horizontal thrust to vertical thrust to shorten the landing distance by increasing the pressure in to the chamber (16), which will push the piston (15) and the top rod (8) up wards, that will crank the crank arm (7) clock wise hence it will start tilting the jet engine from its horizontal position to its vertical position at the swivel pin (6), so that the jet aircraft gradually starts losing horizontal thrust and starts gaining vertical thrust. Once the jet engine is tilted to its maximum vertical position, the jet aircraft will experience 100% vertical thrust that will allow the jet aircraft to do a vertical landing or takeoff.

[0025] The main swivel pin (6), the lifter top swivel pin (11) and lifter swivel pin (13) are well lubricated. The main swivel pin (6) moves through 90 degrees when the jet engine is tilted from its horizontal position to its maximum vertical position. The lifter bottom swivel pin (13), lifter bottom rod housing (14) and lifter top swivel pin (11) will also experience the rotary motion.

[0026] In two drawings (FIG. 9 and FIG. 12) the lifter cylinders were cut to show the pistons inside the cylinder and their positions.

[0027] The crank arms (7) of the both sides jet engine are attached to the jet engine and the crank arm pins (6) are set in to the jet aircraft's main structure beam bearings.

[0028] The lifter bottom swivel pin (13) is stabilized in to the sub frame of the jet aircraft

structure where the lifter bottom rod housing (14) is mounted on to it.

[0029] FIG. 1 is a right view showing closed engine room doors, and hydraulic lifters at zero lift. The engine position is horizontal, hence it allows the jet to fly horizontally.

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[0030] FIG. 2 is a right view showing shows open engine room doors, and hydraulic lifters at zero lift. The engine position is horizontal, hence the jet's travel path is the same as FIG. 1.

[0031] FIG. 3 is a right view showing open engine room doors, where the hydraulic lifters
10 have started lifting the engine to about approximately thirty degrees which will allow the jet to travel horizontally as well as to descend at an angle if the pilot wants to, because at this time, the jet will experience not only horizontal thrust, but it will experience vertical thrust as well.

[0032] FIG. 4 is a right view showing open engine room doors, where the hydraulic lifters
15 have tilted the engine to 90 degrees from the jet's horizontal axis, positioning the engine at approximately the 105-degree mark to the earth's vertical. Because of the manoeuvring weight in front maintained at 15 degrees, that will position the nose of the jet at the 205-degree mark to the earth's vertical, the jet will experience 100% vertical thrust, hence the jet
20 will be able to descend or ascend vertically.

[0033] FIG. 5. is a view of a single engine vertical lift aircraft is the tiltable single jet engine;
(1) the jet's subframe. Engine position has not been tilted, and the jet is experiencing

horizontal thrust.

[0034] FIG. 6. is a view of a five jet engine aircraft according to a preferred embodiment of the invention. The main engine is located centrally, and four sub engines, one on either wing,
5 and two on the tail end of the aircraft providing greater control on its parallel to its plane of horizontal when the jet is on 100% vertical thrust. The time the pilot goes for his 100% vertical landing or vertical liftoff gear.

[0035] Multi-jet engine aircraft need not maintain a manoeuvring weight in front. The engines
10 will stabilize the jet to its parallel to its plane of horizontal when the jet is at its 100% vertical gear.

[0036] FIG. 7. shows the housing, the jet engine, the swivel system and the engine hydraulic lifters according to a preferred embodiment of the invention.

15 [0037] As will readily be appreciated by those skilled in the art, numerous modifications and variations of the above embodiments of the present invention are possible without departing from the scope of the invention.

CLAIMS

I claim:

- 5 10. A vertical lift aircraft, comprising:
- a jet engine,
- said jet engine swivel mounted to a frame of said aircraft,
- at least one lifter mounted on said frame and configured to act directly on said jet
- 10 engine to tilt said jet engine when expanded, said lifter expanded by pressure exerted by a
- fluid .
11. The vertical lift aircraft according to Claim 10, wherein:
- said lifter is hydraulic and said fluid is a liquid.
- 15 12. The vertical lift aircraft according to Claim 10, wherein:
- said lifter is pneumatic and said fluid is a gas.
13. The vertical lift aircraft according to Claim 10, wherein:
- said lifter tilts said engine from a horizontal position to a vertical position when
- 20 expanded.
14. The vertical lift aircraft according to Claim 10, wherein:
- said lifter is configured to obtain any proportions of vertical and horizontal thrust

ranging from 100% vertical to 100% horizontal.

15. A method of tilting a jet engine in an aircraft, comprising:

providing a jet engine,

5 mounting said jet engine on a swivel mount,

providing at least one lifter,

tilting said jet engine by expanding said lifter by pressure exerted by a fluid .

16. The method according to Claim 15, wherein:

10 said fluid is a liquid.

17. The method according to Claim 15, wherein:

said fluid is a gas.

15 18. The method according to Claim 15, wherein said step of tilting said jet engine further comprises:

tilting said engine from a horizontal position to a vertical position.

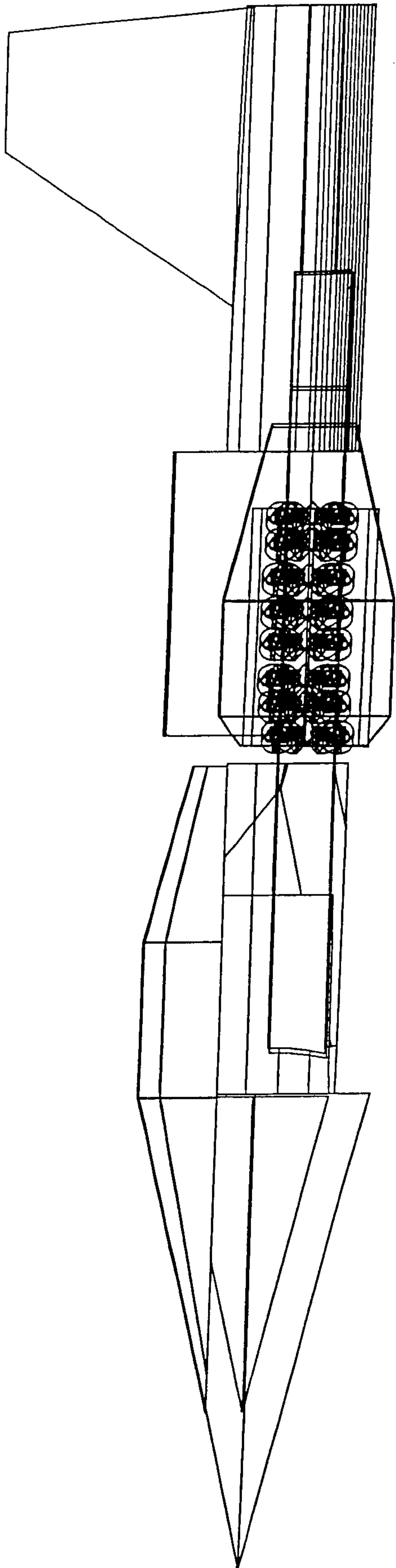


FIG 1

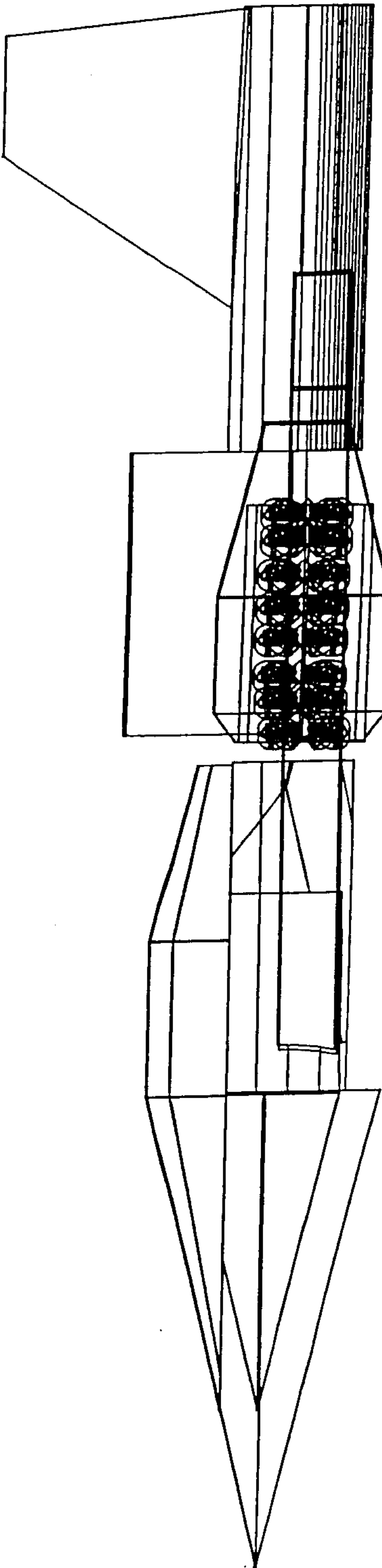


FIG 2

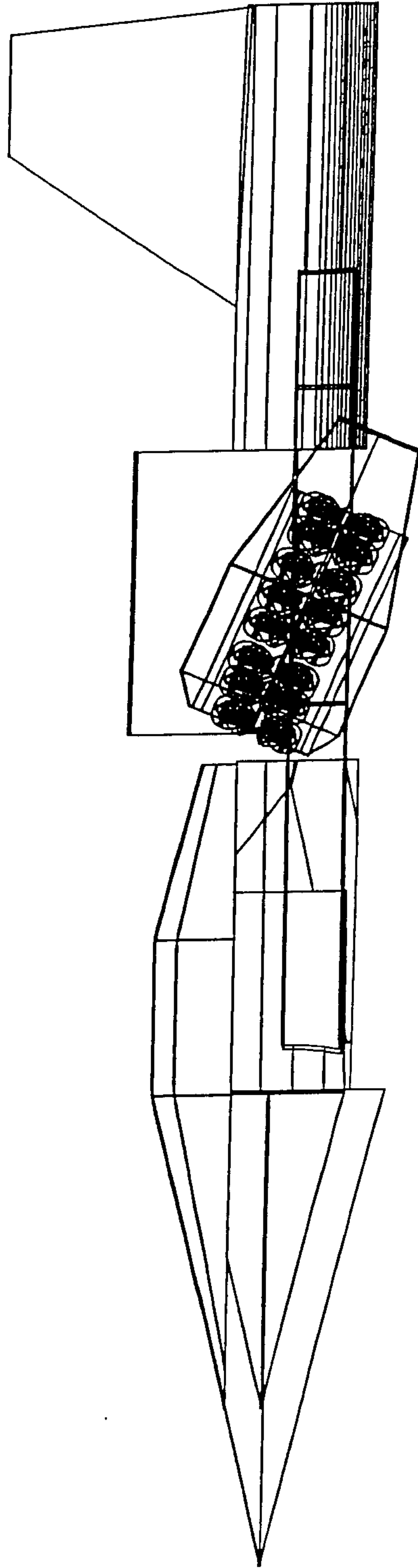


FIG 3

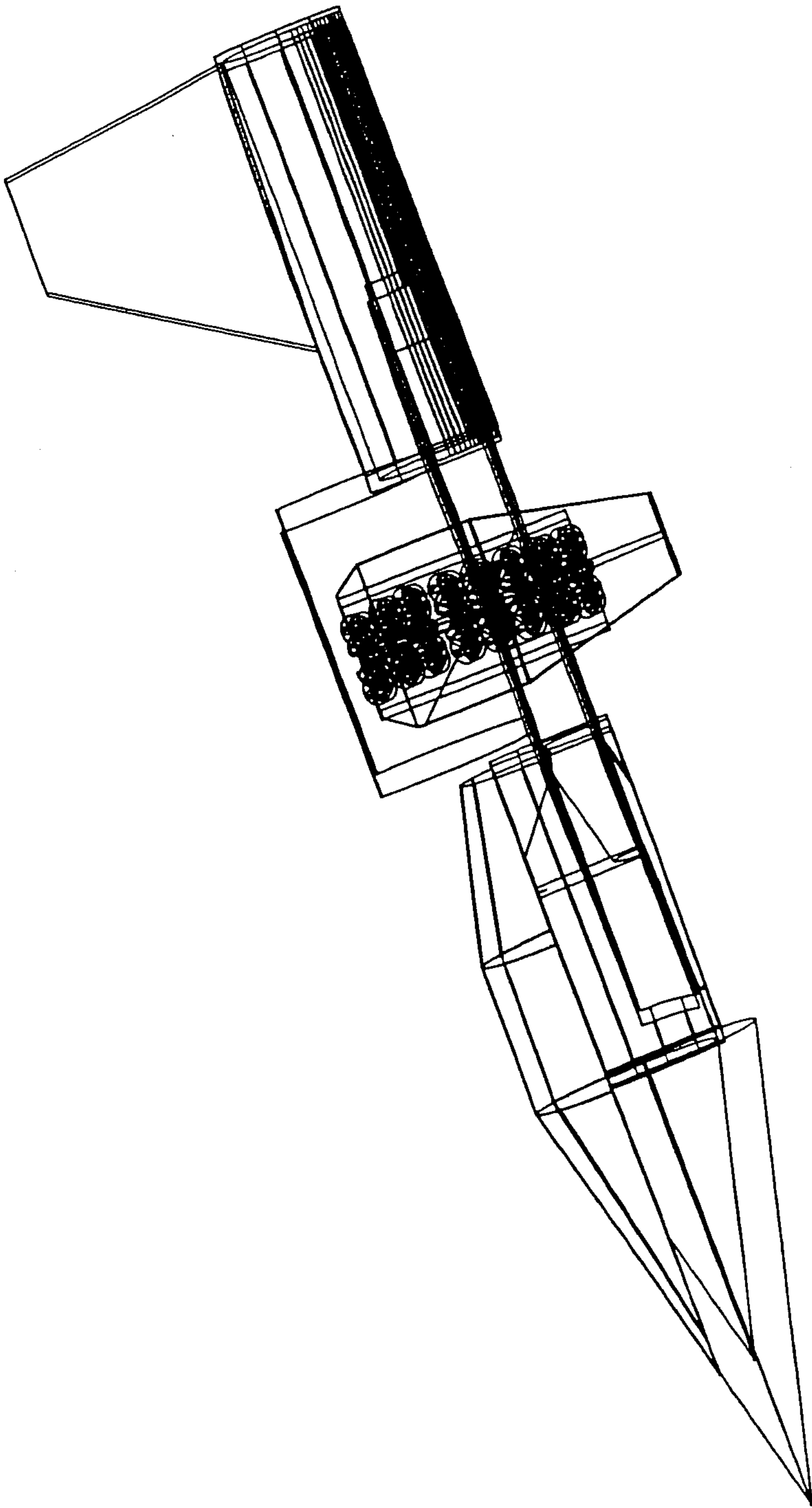


FIG 4

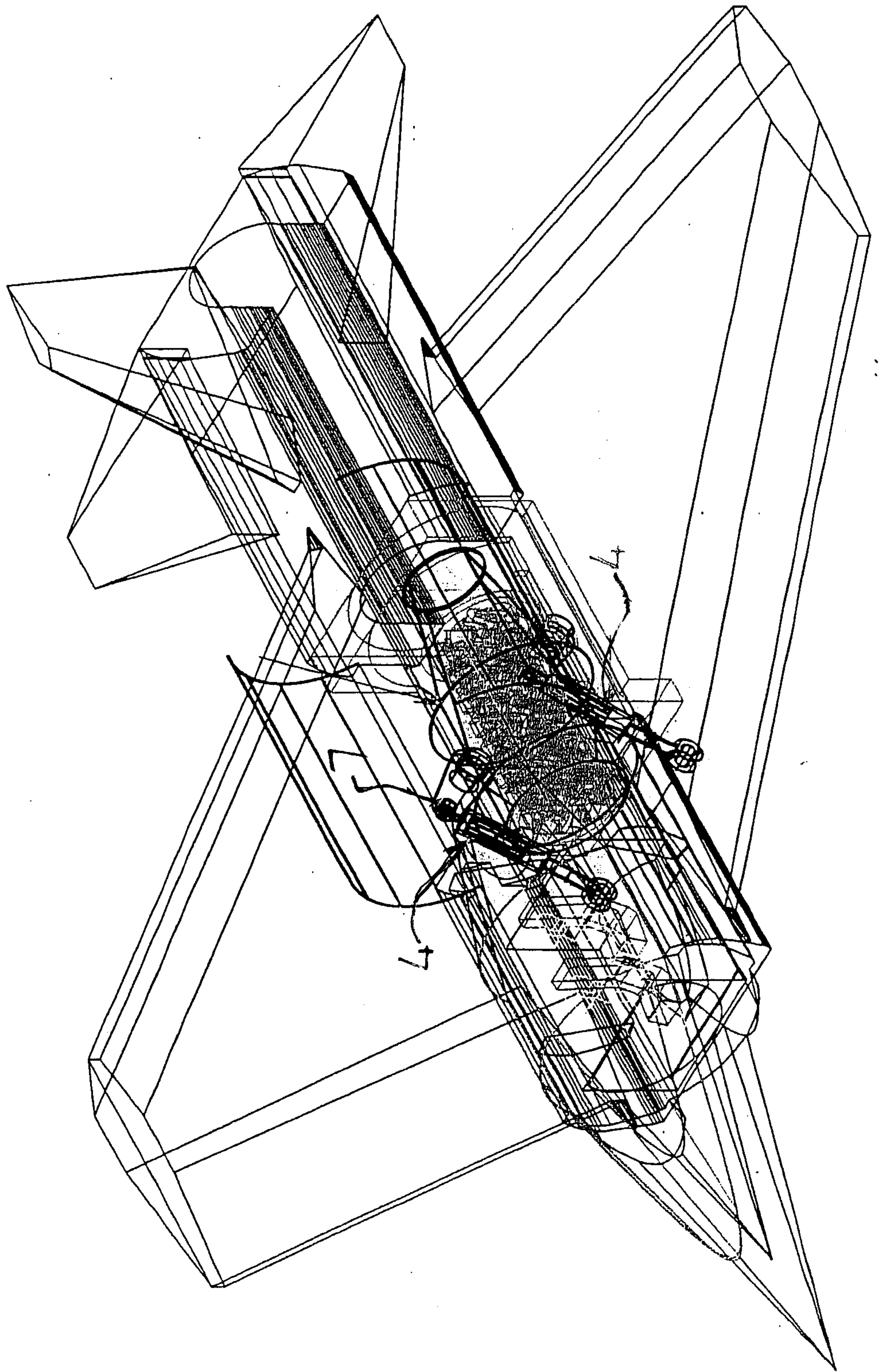
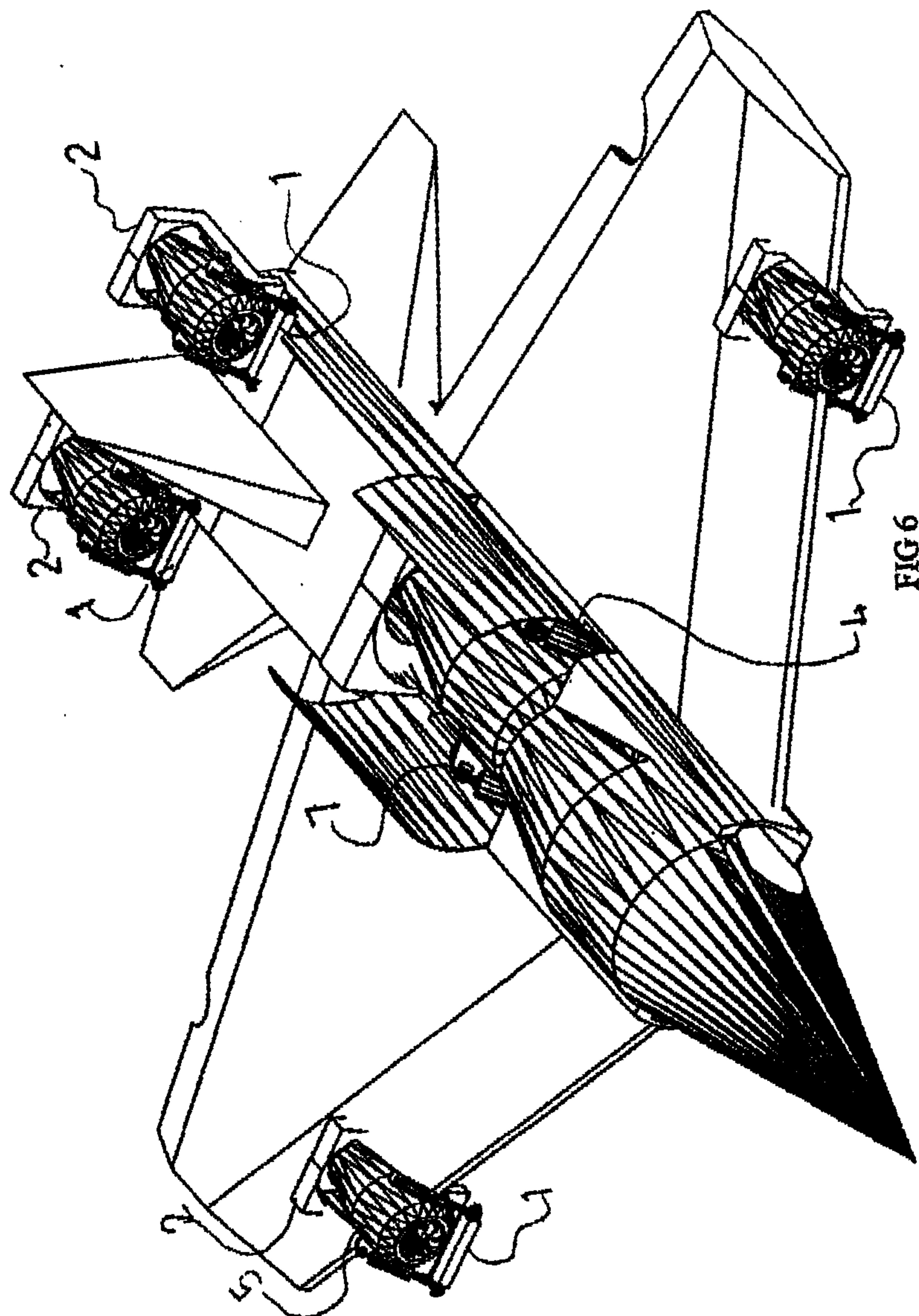
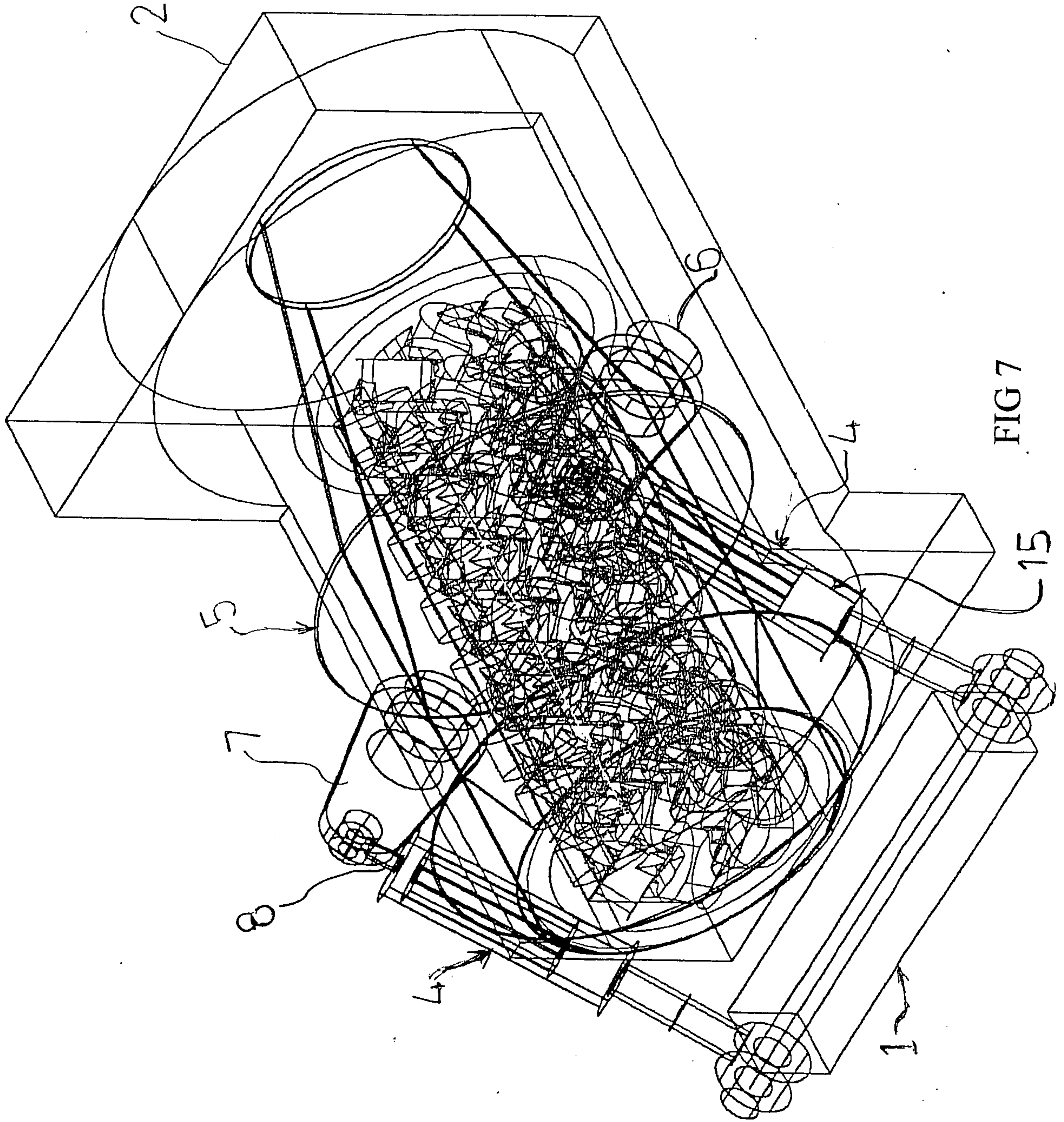


FIG 5





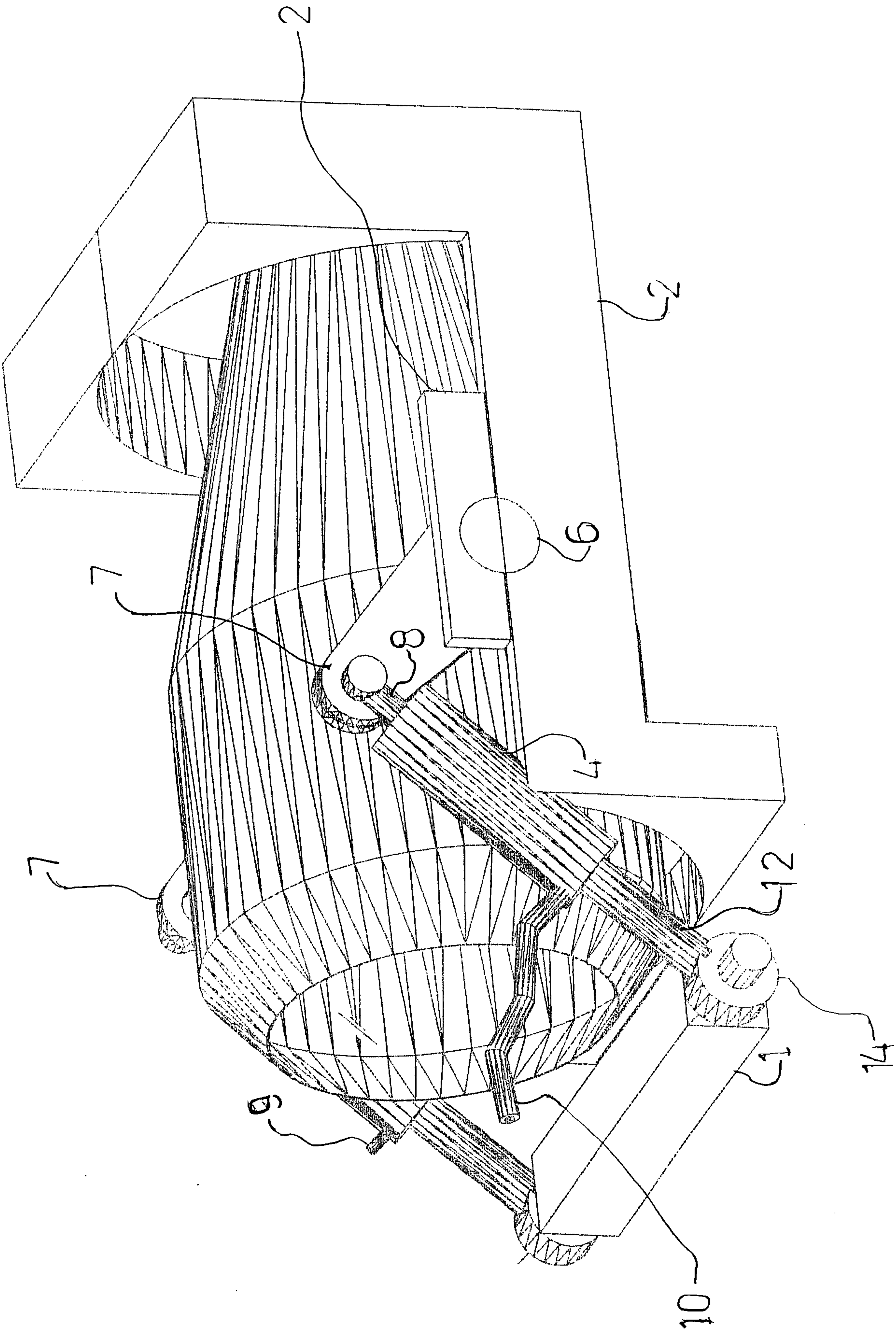


FIG 8

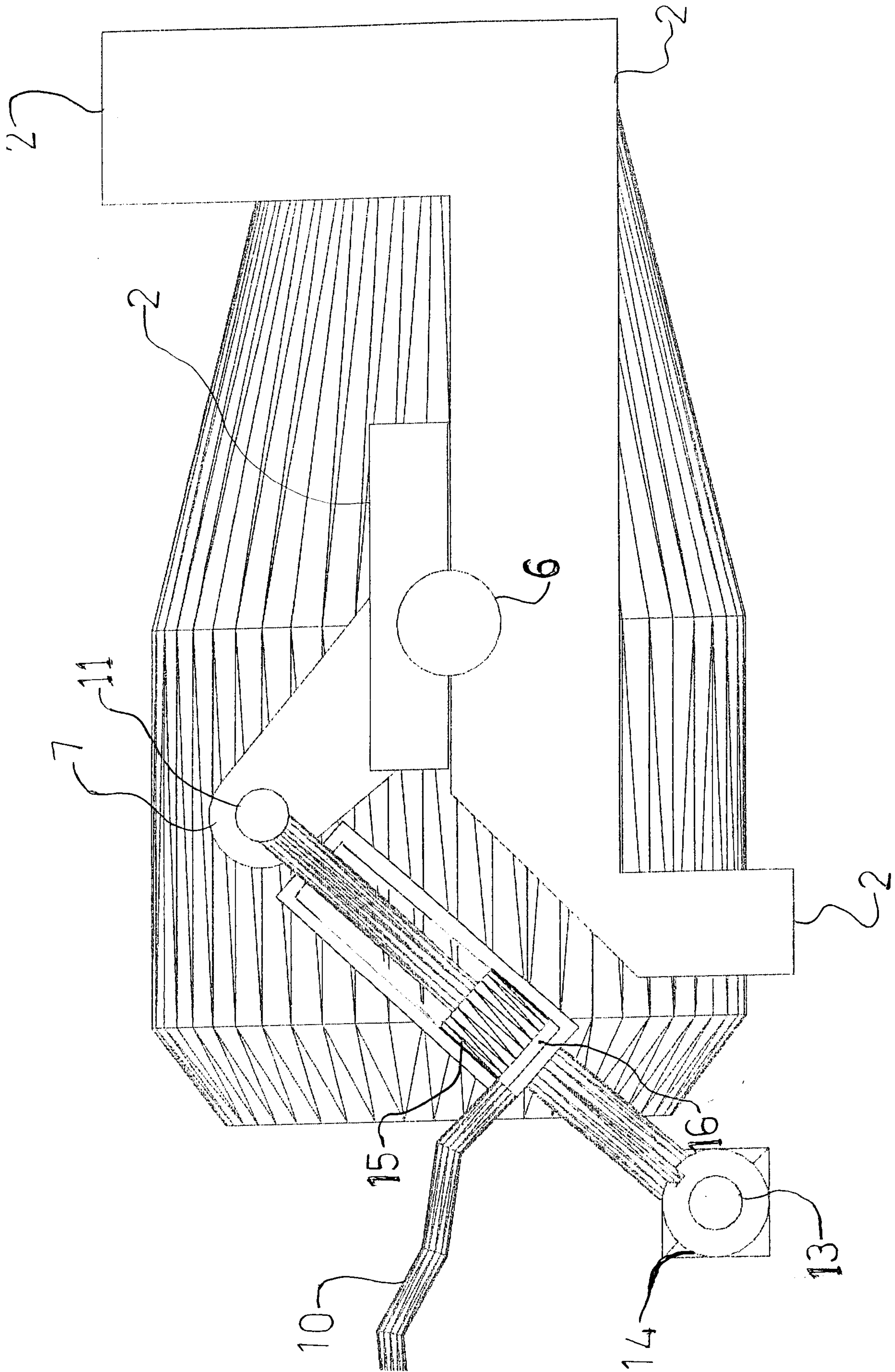


FIG 9

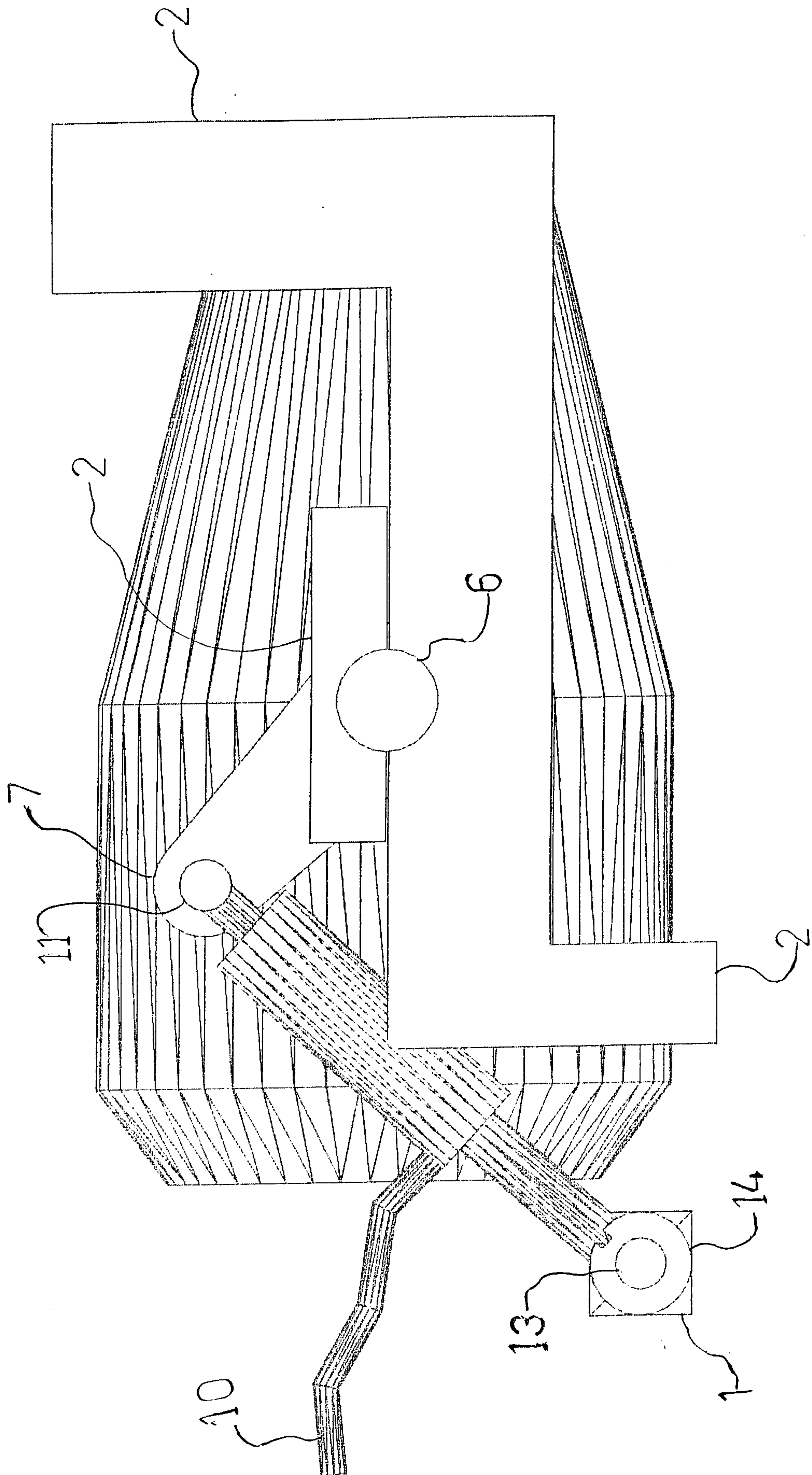
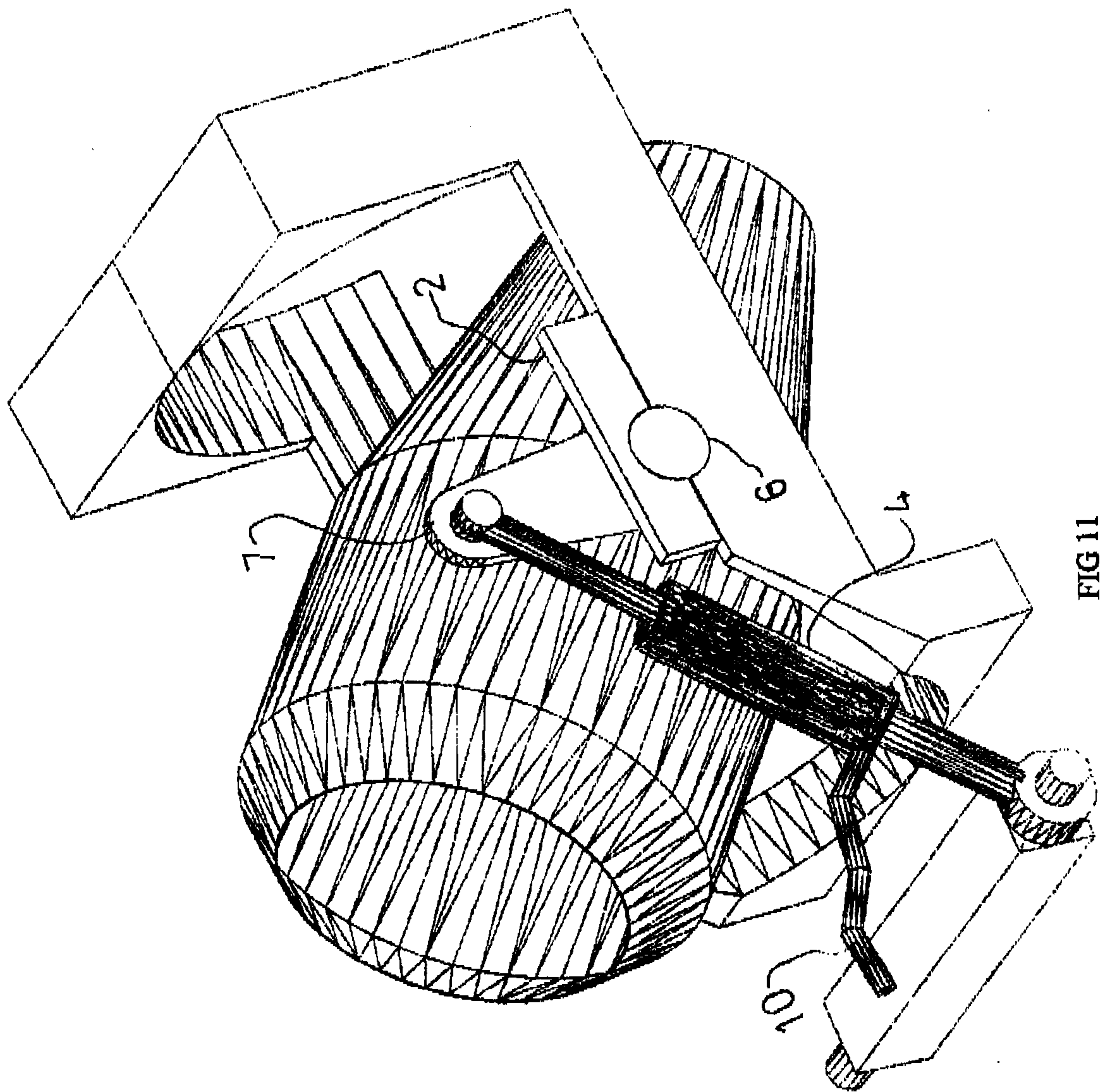


FIG 10



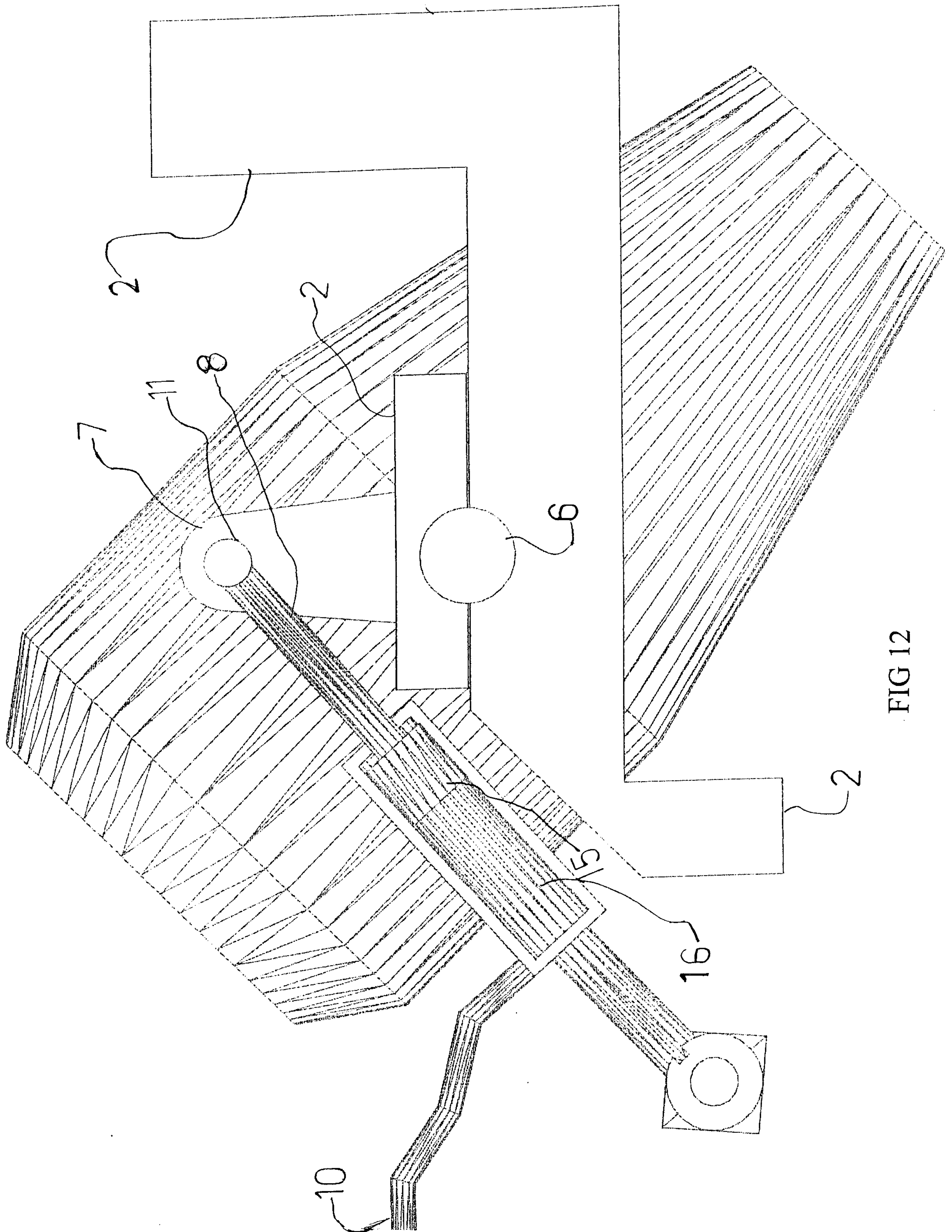


FIG 12

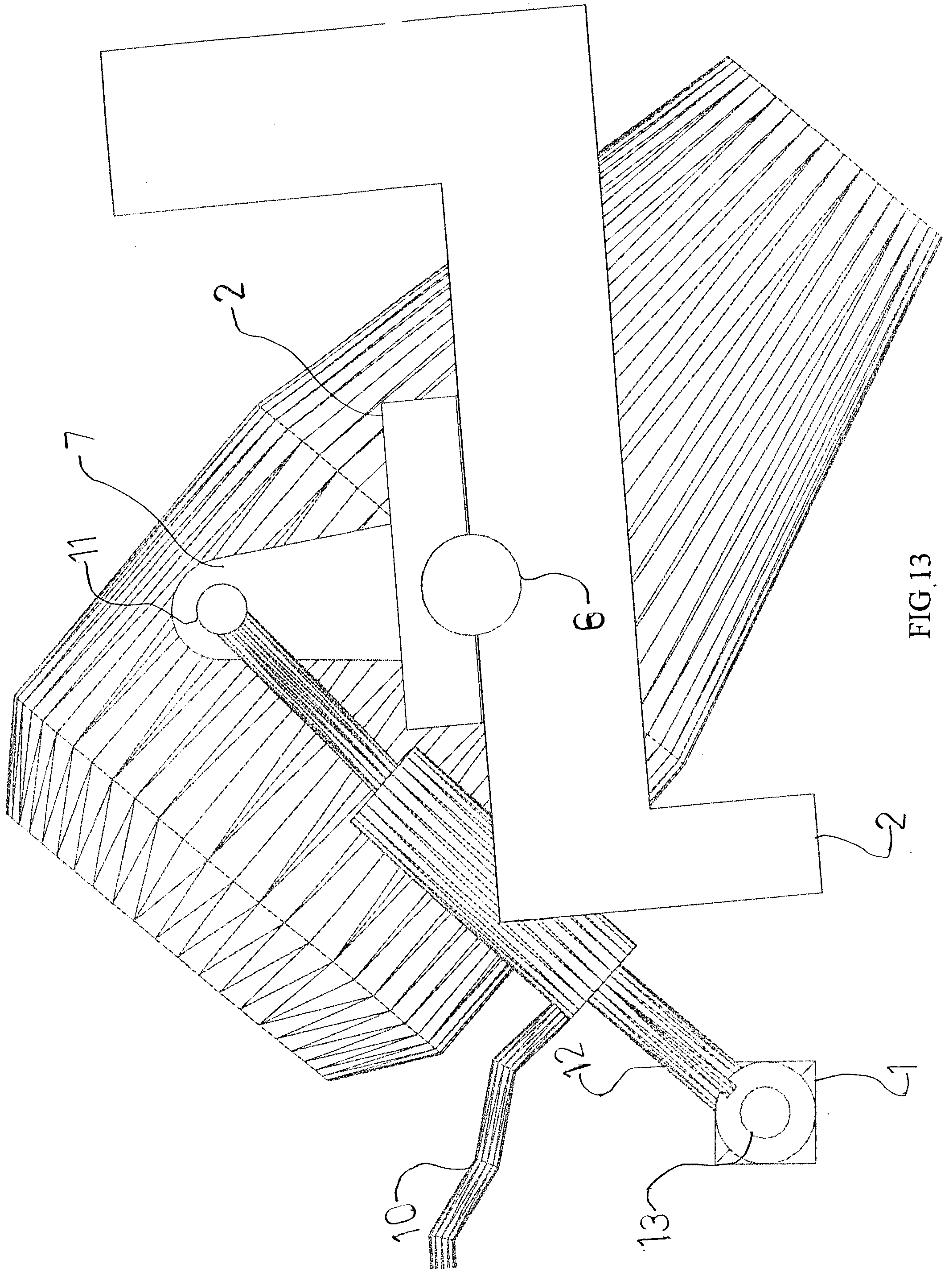


FIG. 13

