COMMISSIONER'S DECISION

OBVIOUSNESS: **Anti-Skid Mechanism**

A vehicle anti-lock brake system which releases the hydraulic system on the occurrence of a wheel skid condition is shown in the prior art. In response to the Final Action the applicant submitted one specific claim replacing the previous forty one claims.

Rejection: Amended claim accepted.

****

This decision deals with a request for review by the Commissioner of Patents of the Examiner's Final Action dated May 27, 1976, on application 142,760, Class 303-73. The application was filed on May 23, 1972, and is entitled "Anti-Skid Mechanism".

This application relates to an anti-lock brake system for fluid actuated brakes of a wheeled vehicle. An electrical signal indicates the occurance of a "locked" wheel and a control valving arrangement is used to relieve the fluid pressure applied from the master cylinder to the wheel brakes. Figure 1 shown below illustrates the applicants invention.

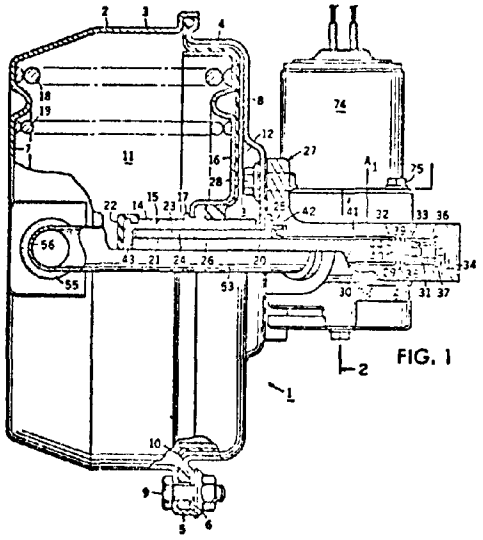


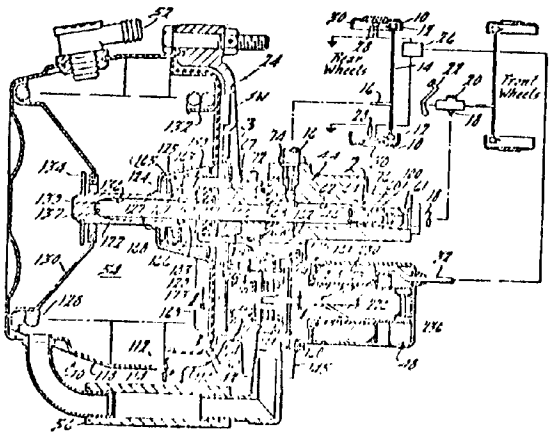
FIG. 1

In the Final Action the examiner refused the application for failing to define patentable subject matter in view of the following patent.

United States

3,486,800 Dec. 30, 1969 Ayers

The Ayers patent relates to a skid control system for fluid actuated brakes of a wheeled vehicle. This patent uses a valving arrangement controlling the pressure to the brakes in response to an electrical signal indicating the occurrence of a wheel skid condition. Figure 1 of Ayers is shown below.



In the Final Action the examiner stated (in part):

> ...
>
> Applicant's alleged invention differs from Ayers device in two ways. First, applicant's orifice means is located in the uni-directional valve means while Ayers' orifice means is not located in the uni-directional valve, means per se but in an area associated with the uni-directional valve means. Since neither Ayers' nor applicant's orifice means have any moving parts but are merely open to allow a restricted flow of exhausting atmosphere the actual physical location of the orifice means is immaterial....
>
> ...
>
> Ayers' valve consists of a movable valve element 167 supported on the diaphragm member and resiliently biased into engagement with the housing 163. The valve member moves under the influence of the biasing spring 168 until the flange of a cup engages the valve element to disengage the valve element from the housing and opens the passage.
>
> Ayers' valve is an equivalent valve to applicant's, it operates in a similar manner to achieve the same result. While applicant's valve is held by the housing and engages a movable diaphragm until the diaphragm moves a predetermined distance Ayers' valve is held by the movable diaphragm and engages the housing until the diaphragm moves a predetermined distance.
>
> Simply reversing Ayers' known valve is not considered invention....

In response to the Final Action the applicant cancelled the 41 claims and submitted one amended claim. He also stated (in part):

> ...
>
> Applicant agrees that the teachings of the reference are very close to the present invention but it is applicant's firm belief that the present application does include subject matter which is significantly different from that of the citation. In view of the close structure and function of the present invention to that of the citation applicant has cancelled all of the forty-one claims previously on file and has replaced those claims with a new, restricted, claim 1. It is applicant's firm belief that the new claim 1 as herein presented structurally defines a significantly different invention from that of the citation....
>
> ...
>
> The Examiner is particularly referred to sub-paragraphs (d) and (j) of the amended claim. The throttling means (82) of sub-paragraph (d) is different from the valve means 167 of the reference and, additionally, the valve member (62) defined in sub-paragraph (j) is totally absent from the similar valve 158 of the reference (Figure 4 thereof).
>
> Additionally, the elements 46, 112, 120, 161, 158, 162, 166, 169, 172, 173, 175 and 170, as referred to by the Examiner in the last paragraph of page 1 of the Final Action, are inefficiently scattered about the structure as shown in Figure 1 and their cooperation, interaction and functioning require additional structure. On the other hand, applicant's elements 41, 10, 16, 59, 79, 81, 91, 86 and 92 accomplish their result in a simpler way. Referring to applicant's Figures 2 and 3 note the proximity in the housing 27 of the interconnecting passage means 45, 79, the atmosphere/vacuum control valve 59, the throttling valve 86, the unidirectional valve 91 and orifice 92 as taught by the applicant. Thus the present invention as now claimed includes structural features which substantially simplify the total apparatus or device and which distinguish the present invention from the prior art....

The issue to be considered is whether or not the applicant has made a patentable advance in the art. Claim 1 of the application reads:

> An anti-skid device comprising:
>
> a) a housing;
>
> b) an expansible chamber mounted on the housing having a fluid pressure responsive member movable in the chamber between opposed positions in response to fluid pressure selectively applied thereto and exhausted therefrom;
>
> c) resilient means in the chamber to urge said fluid pressure responsive member to one of its opposed positions;

d) throttling means in the housing for controlling the passage therethrough of fluid pressure selectively applied to and exhausted from the chamber, said throttling means including:

1) uni-directional valve means including a movable member for effecting the passage only of applied fluid pressure into said chamber to initiate the movement of said pressure responsive member from the one of its opposed positions toward the other thereof;

2) second valve means engaged with said pressure responsive member in the one of the member's opposed positions and disengaged from said member upon the movement thereof in excess of a predetermined amount toward the other opposed position of the member, said second valve means including passage means for effecting the passage of applied and exhausted fluid pressure to and from said chamber when said second valve means is disengaged from said member, said second valve means interrupting the passage therethrough of both the applied and exhausted fluid pressure when engaged with said pressure responsive means in its one opposed position;

3) orifice means included in said movable member of said uni-directional valve means for restricting the passage therethrough of exhausted fluid pressure from said chamber when said second valve means is engaged with said pressure responsive member; and

4) a valve seat on said second valve means about said passage means for engagement with said pressure responsive member, said valve seat being engaged with said member in its one opposed position to preclude the passage of fluid pressure through said passage means and being disengaged from said member upon the movement thereof in excess of the predetermined amount toward its other opposed position to effect the passage of applied and exhausted fluid pressure to and from said chamber through said passage means;

e) atmospheric, vacuum and delivery chambers in the housing;

f) a valve seat formed in the housing between the atmospheric and delivery chambers;

g) another valve seat formed in said housing between the vacuum and delivery chambers; and

h) valve means movable in the housing between one position engaging the valve seat between the atmospheric and delivery chambers for isolating the atmospheric chamber and connecting the vacuum and delivery chambers and another position engaging the valve seat between the vacuum and delivery chambers for isolating the vacuum chamber and connecting the atmospheric and delivery chambers;

i) the valve means including opposed valve members mounted thereon for sealing engagement with the valve seats;

j) the valve member for engaging the valve seat between the atmospheric and delivery chambers including:

> 1) diaphragm means for sealing engagement with its respective valve seat;
>
> 2) a valve chamber defined by the inside of said diaphragm means and a closed wall of said housing within the atmospheric chamber, said valve chamber being isolated from communicating with said atmospheric chamber when said valve means is in said one position;
>
> 3) a sleeve insert mounted on and within the diaphragm means; and
>
> 4) passage means extending through the insert to communicate the delivery and valve chambers.

The Final Action details the elements which are similar where it states that Ayers discloses:

> a housing, means movable therein for controlling a supplied fluid pressure 46, resiliently urged means 112, 120, engaging the movable means to control the supplied fluid pressure control means 161, 158 for controlling vacuum and atmosphere to the chambers, means defining passage means between the control means and the other chamber 162, 166, 169, throttling means including uni-directional valve means 172, 173 for one way passage of atmosphere, other valve means 165 and orifice means 170.

In his response the applicant argues that these elements as found in Ayers are "inefficiently scattered about the structure as shown in Figure 1 and their cooperation, interaction and functioning require additional structure." Further the applicant contends that his arrangement accomplishes the desired result in a simpler way. Looking at these elements we find that the applicants arrangement does provide a simpler arrangement which is more compact in its physical layout.

Considering the elements as outlined in amended claim 1 we find some areas which do not have a corresponding element in the Ayers citation. For example in J(3) of claim 1 reference is made to a "sleeve insert (69)" and we do not find any element in Ayers which could be considered equivalent. This is followed by J(4) which indicates "passage means extending through the insert to communicate the delivery and valve chambers." Granted there is passage means shown in Ayers but it does not use any insert on the valve seat. There is an indication on page 9 of the disclosure which relates to the importance of this arrangement where it states that "the valve chamber 73 is subject to either vacuum or atmosphere prevailing in the delivery chamber 45, then it is apparent that the valve member 62 is predeterminately balanced."

Again at the bottom of page 17 it states "the atmosphere and vacuum prevailing in the control housing bore 45 and counterbore 46 respectively acting on area A2 of the valve member 61 when it is engaged with the valve seat 48 establishes a differential force acting aginst the force of the magnetic holding engagement of the armature 78 with the pole piece 77; however, as previously mentioned, the current necessary to maintain the magnetic holding engagement between the armature and pole piece is appreciably less than that necessary to excite said armature toward such magnetic holding engagement with said pole piece." Thus it appears that balance sensitivity is more acute in the application than in the Ayers patent.

Another area of difference between the application and citation is found in d(3) of amended claim 1. This portion specifies "orifice means included in said movable member", while the "orifice" means in Ayers is adjacent to the movable member. Similarily portion d(4) requires "said second valve means about said passage means for engagement with said pressure responsive member" whereas Ayers seal member (167) does not engage the pressure responsive member.

Having considered all the arguments brought to the Boards attention we are constrained to conclude, but not without some hesitation, that the applicant has made a patentable advance in the art. We are satisfied that amended claim 1 overcomes the grounds of rejection in the Final Action. We recommend that the amendments be accepted.

J.F. Hughes
Assistant Chairman
Patent Appeal Board, Canada

I have studied the prosecution of this application and reviewed the recommendation of the Patent Appeal Board. In the circumstance I will accept claim 1 which was amended in response to the Final Action. The application is returned to the examiner for resumption of prosecution.

J.H.A. Gariepy
Commissioner of Patents

Agent for Applicant

Alex E. MacRae & Co.
P.O. Box 806, Station B
Ottawa, Ontario
K1P 5T4

Dated in Hull, Quebec

this 11th. day of August, 1977